Armenian Theory of Relativity Articles

(Between years 2007 - 2014)

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Authors Preface

Dear Readers, in this book you will find an alternative theory of relativity, that we have rightfully named Armenian Theory of Relativity, which is a mathematically solid theory and in it you will find new transformation equations and amazing formulas that the World has never seen before. That's the reason why we think our new theory deserves to have its own special name.

In this book we have presented our articles in chronological order, but you can read them in any order you wish.

We have received a generous offer from LAMBERT Academic Publishing (LAP), who informed us that this particular topic could be of interest to a wider audience and LAP would be glad to consider publishing it, if we compile our articles in a book form.

That is exactly what we have done here, by collecting articles written only in English, between the years 2007 - 2014.

However, the original research was done in Armenian and published by Yerevan State University in Armenia, June 2013.

Meanwhile in English we have written several articles explaining and uncovering different crucial aspects of the Armenian Theory of Relativity. For example, you can see that our new theory does not conflict with the legacy theory of relativity, which is a very special case in the Armenian Theory of Relativity.

We like to mention here only one very important aspect of our theory and that is the theoretical foundation of infinite free energy. Without doubt, this is of absolute importance to every country that wishes to free itself from the disastrous consequences of using fossil fuels, which is imperative for the existence and future of mankind.

We hope, you already know that the legacy theory of relativity unleashed the rest particle (m_0c^2) energy, which became the theoretical foundation of nuclear power. The Armenian Theory of Relativity unleashes the rest particle $(-\frac{1}{2}sm_0c)$ momentum-energy which becomes as a clean-free energy source - universally available everywhere and anytime.

This book just might give your mind the creative spark that it has been yearning for so long.

Maybe you know that there is something wrong with theoretical physics which has halted after 1928.

You might have felt it your entire life, you don't know what it is and you can't explain it, but it's there, like a splinter in your mind driving you mad.

If you are ready, then this is your chance to wake up. You can either discard this new theory and believe in the old one, which has led us to a dead end path, or follow us to uncharted territory in theoretical physics and enjoy the beauty of precise mathematical truth, where the possibilities are endless.

If you see the same ideas or almost the same formulas in different places repeated in this book, try to remember that this is just a collection of our different articles about the same subject and I hope the repetition does not effect your intellectual judgment.

Also please don't hesitate to communicate with me via E-mail: robert@armeniantheory.com .

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1. Armenian Transformation Equations In 3D

Very special case, but still more correct than Lorentz Transformation Equations in 3D

(Created 02 February 2007)

100th Anniversary of the Relativity Theory

This Research done in Armenia 1968-1988, Translated from the Armenian Manuscript
Yerevan State University (Armenia), Byurakan Astrophysical Observatory (Armenia)

Abstract

In this article, we derive a new transformation equations of relativity in 3D using the following guidelines:

1. *We use **only vector notations** to obtain the new transformation equations in a general form.*

2. *In the process of deriving new transformation equations in vector form, **we also keep the term** $\vec{v} \times \vec{r}$.*

3. *Newly obtained transformation equations **need to satisfy the linear transformation fundamental laws**.*

4. *Addition of velocities we calculate in two different ways: by linear superposition and by differentiation, and they need to coincide each other. If not, then **we force them to match** for obtaining the final relation between coefficients.*

After using the above mentioned general guidelines, we obtain direct and inverse transformation equations named the Armenian transformation equations, which are the replacement for the Lorentz transformation equations.

Introduction to the Armenian Transformation Equations in 3D

The Lorentz transformation equations, as we know them, in two dimensional time-space (t, x) or in four-dimensional time-space $(t, \vec{r})$, when the inertial systems move at a constant relative velocity $\vec{v}$ along one of the chosen axis, are linear orthogonal transformations. In these cases Lorentz transformations are a group and satisfy the fundamental linear transformation rules: $L(v)L(u') = L(u)$. Where the resultant transformation is a Lorentz transformation as well with the resultant velocity $u = (v + u')/\left(1 + \frac{vu'}{c^2}\right)$. In general, when the relative velocity $\vec{v}$ of the inertial systems S and S' have an arbitrary direction, then the Lorentz transformation is not a group and are therefore less discussed as a case. Only a few brave authors mention and discuss this general case (axes of the inertial systems they take parallel to each other as usual). The main linear transformation law $L(\vec{v})L(\vec{u}') = L(\vec{u})$ fails for the general Lorentz transformation. Since, however, a resultant transformation must be a Lorentz transformation as well, physicist need therefore to add an extra *artificial transformation* called the *Thomas precession,* to compensate for the error. This is the Achilles heel in the Lorentz transformation equations in 3D and more precisely in all special and general theory of relativity. *Therefore it is an imperative, that the Lorentz transformation equations be replaced by new ones, which must be consistent with linear transformation fundamental laws and have a common sense in respect to reality.* Here we shall derive these *New transformation equations*, using **pure mathematical logic without any limitations** and the following three postulates:

1. *All physical laws have the same mathematical(tensor) form in all inertial systems.*

2. *There exists a boundary velocity, denoted as c, between micro and macro worlds, which is the same in all inertial systems.*

3. *The simplest transformation equations of the moving particle between two inertial systems S and S' we have only when relative velocity, measured in two inertial systems, satisfy the reciprocal relation $\vec{v}' = -\vec{v}$.*

These first two postulates are **almost the same** as the Special Relativity Theory postulates, but the third postulate is quite new and necessary for receiving the simplest transformation equations **without ambiguity problems** in orientation of the inertial systems axes.

All authors that I know, derive the Lorentz transformation equations using two Cartesian coordinates (t, x) or as a general way using four Cartesian coordinates (t, x, y, z). Nobody (that I know of) uses **vector notations** to derive general transformation equations for relativity. Many authors **artificially construct** 3D Lorentz transformation equations in vector form using one dimensional Lorentz transformation equations and therefore those generalized results cannot be correct. The laws of logic tell us, that we need to go from the general case to the special case. That's why we derive our *New transformation equations* using the **most general considerations** and adapting **vector notation**. The great merit of the vectors in the theoretical and applied problems is that equations describing physical phenomena can be formulated *without reference to any particular coordinate system*, without worry that coordinate systems axes are parallel to each other or not. However, in actually carrying out the calculations we need to find a *suitable coordinate system (our third postulate)* where equations can have the simplest form. Therefore to receive the correct transformation equations we need to use **only vector notations** and focus on it entirely. Using this new promising approach and one additional postulate we derive **truly correct transformation equations in the general and simplest form**.

The other question can arise - why are we calling our newly received transformation equations the *Armenian Transformation Equations?* The answer is very simple. *This research was done for more than 40 years in Armenia by an Armenian and the manuscripts were written in Armenian. This research is purely from the mind of an Armenian and from the Holy land of Armenia, therefore we can rightfully call these newly derived transformation equations the Armenian Transformation Equations and the theory the Armenian Theory of Relativity or ATR.*

Summary of the Armenian Transformation Equations In 3D

- *Direct and Inverse Armenian transformation equations*

Direct transformations		Inverse transformations
$\begin{cases} t' = \gamma\left(t + g^2 \frac{1}{c^2}\vec{v}\vec{r}\right) \\ \vec{r}\,' = \gamma\left(\vec{r} - \vec{v}t - g\frac{1}{c}\vec{v}\times\vec{r}\right) \end{cases}$	and	$\begin{cases} t = \gamma\left(t' - g^2 \frac{1}{c^2}\vec{v}\vec{r}\,'\right) \\ \vec{r} = \gamma\left(\vec{r}\,' + \vec{v}t' + g\frac{1}{c}\vec{v}\times\vec{r}\,'\right) \end{cases}$

(1-1)

- *Armenian gamma function*

$$\gamma = \frac{1}{\sqrt{1 + g^2 \frac{v^2}{c^2}}} \tag{1-2}$$

- *Invariant Armenian interval*

$$s^2 = c^2 t'^2 + g^2 r'^2 = c^2 t^2 + g^2 r^2 \tag{1-3}$$

- *Addition and subtraction of the velocities*

Addition of the velocities		Subtraction of the velocities
$\vec{u} = \dfrac{\vec{u}\,' + \vec{v} + g\frac{1}{c}\vec{v}\times\vec{u}\,'}{1 - g^2\frac{1}{c^2}\vec{v}\vec{u}\,'}$	and	$\vec{u}\,' = \dfrac{\vec{u} - \vec{v} - g\frac{1}{c}\vec{v}\times\vec{u}}{1 + g^2\frac{1}{c^2}\vec{v}\vec{u}}$

(1-4)

- *Important relations 1*

$$\boxed{\begin{cases} \vec{v}\vec{r} &= \gamma\left(\vec{v}\vec{r}^{\,\prime} + v^2 t'\right) \\ \vec{v}\vec{r}^{\,\prime} &= \gamma\left(\vec{v}\vec{r} - v^2 t\right) \end{cases}} \tag{1-5}$$

- *Important relations 2*

$$\boxed{\begin{cases} \frac{1}{c}\left(\vec{v}\times\vec{r}\right) &= \gamma\left[-g\frac{v^2}{c^2}\vec{r}^{\,\prime} + g\frac{1}{c^2}\left(\vec{v}\vec{r}^{\,\prime}\right)\vec{v} + \frac{1}{c}\left(\vec{v}\times\vec{r}^{\,\prime}\right)\right] \\ \frac{1}{c}\left(\vec{v}\times\vec{r}^{\,\prime}\right) &= \gamma\left[g\frac{v^2}{c^2}\vec{r} - g\frac{1}{c^2}\left(\vec{v}\vec{r}\right)\vec{v} + \frac{1}{c}\left(\vec{v}\times\vec{r}\right)\right] \end{cases}} \tag{1-6}$$

- *Important relations 3*

$$\boxed{\begin{cases} \sqrt{1+g^2\frac{u^2}{c^2}} &= \dfrac{\sqrt{1+g^2\frac{v^2}{c^2}}\,\sqrt{1+g^2\frac{u'^2}{c^2}}}{1-g^2\frac{1}{c^2}\vec{v}\vec{u}^{\,\prime}} \\ \sqrt{1+g^2\frac{u'^2}{c^2}} &= \dfrac{\sqrt{1+g^2\frac{v^2}{c^2}}\,\sqrt{1+g^2\frac{u^2}{c^2}}}{1+g^2\frac{1}{c^2}\vec{v}\vec{u}} \end{cases}} \tag{1-7}$$

- *Important relation 4*

$$\boxed{\left(1+g^2\frac{\vec{v}\vec{u}}{c^2}\right)\left(1-g^2\frac{\vec{v}\vec{u}^{\,\prime}}{c^2}\right) = 1+g^2\frac{v^2}{c^2}} \tag{1-8}$$

Where coefficient g is a real constant number characterizing the time-space medium.

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2. Armenian Theory of Relativity in One Dimension

Short Report About Our Main Research Results (Created 04 April 2013)

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Abstract

By using the principle of relativity (first postulate), together with new defined nature of the universal speed (our second postulate) and homogeneity of time-space (our third postulate), we derive the general transformation equations of relativity in one dimensional space. According to our new second postulate, the universal (not limited) speed c in Armenian Theory of Relativity is not the actual speed of light but it is the speed of time which is the same in all inertial systems. Our third postulate: the homogeneity of time-space is necessary to furnish linear transformation equations. We also state that there is no need to postulate the isotropy of time-space. Our article is the accumulation of all efforts from physicists to fix the Lorentz transformation equations and build correct and more general transformation equations of relativity which obey the rules of logic and fundamental group laws without internal philosophical and physical inconsistencies.

Introduction

On the basis of the previous works of different authors,[2,3,4,5] a sense of hope was developed that it is possible to build a general theory of Special Relativity without using light phenomena and its velocity as an invariant limited speed of nature. Many authors also explore the possibility to discard the postulate of isotropy time-space.[1,4]

In the last five decades, physicists gave special attention and made numerous attempts to construct a theory of Special Relativity from more general considerations, using abstract and pure mathematical approaches rather than relying on so called experimental facts.[6]

After many years of research we came to the conclusion that previous authors did not get satisfactory solutions and they failed to build the general transformation equations of Special Relativity even in one dimensional space, because they did not properly define the universal invariant velocity and did not fully deploy the properties of anisotropic time-space.

However, it is our pleasure to inform the scientific community that we have succeeded to build a mathematically solid theory which is an unambiguous generalization of Special Relativity in one dimensional space.

The principle of relativity is the core of the theory relativity and it requires that the inverse time-space transformations between two inertial systems assume the same functional forms as the original (direct) transformations. The principle of homogeneity of time-space is also necessary to furnish linear time-space transformations respect to time and space.[2,3,5]

There is also no need any more to use the principle of isotropy time-space, which is the key to our success.

To build the general theory of Special Relativity in one physical dimension, we use the following three postulates:

$$\begin{cases} 1.\ \text{All physical laws have the same mathematical functional forms in all inertial systems.} \\ 2.\ \text{There exists a universal, not limited and invariant boundary speed } c, \text{ which is the speed of time.} \\ 3.\ \text{In all inertial systems time and space are homogeneous (Special Relativity).} \end{cases} \tag{2-01}$$

Besides the postulates $(2-01)$, for simplicity purposes we also need to use the following initial conditions as well:

$$\begin{cases} \text{When} \quad t = t' = t'' = \ldots = 0 \\ \text{Then origins of all inertial systems coincide each other, therefore} \quad x_0 = x_0' = x_0'' = \ldots = 0 \end{cases} \tag{2-02}$$

Because of the first and third postulates $(2-01)$, time and space transformations between inertial systems are linear:

$$\underline{\text{Direct transformations}} \qquad\qquad \underline{\text{Inverse transformations}}$$

$$\begin{cases} t' = \beta_1(v)t + \beta_2(v)x \\ x' = \gamma_1(v)x + \gamma_2(v)t \end{cases} \quad \text{and} \quad \begin{cases} t = \beta_1(v')t' + \beta_2(v')x' \\ x = \gamma_1(v')x' + \gamma_2(v')t' \end{cases} \tag{2-03}$$

Armenian Relativistic Kinematics

Using our postulates $(2-01)$ with the initial conditions $(2-02)$ and implementing them into the general form of transformation equations $(2-03)$, we finally get the general transformation equations in one physical dimension, which we call - **Armenian transformation equations**:

Direct transformations and Inverse transformations

$$\begin{cases} t' = \gamma_{չ}(v)\left[\left(1+s\frac{v}{c}\right)t + g\frac{v}{c^2}x\right] \\ x' = \gamma_{չ}(v)(x-vt) \end{cases} \quad \text{and} \quad \begin{cases} t = \gamma_{չ}(v')\left[\left(1+s\frac{v'}{c}\right)t' + g\frac{v'}{c^2}x'\right] \\ x = \gamma_{չ}(v')(x'-v't') \end{cases} \tag{2-04}$$

Armenian transformation equations $(2-04)$, contrary to the Lorentz transformation equations, has two new constants (s and g) which characterize anisotropy and homogeneity of time-space. Lorentz transformation equations and all other relativistic formulas can be obtained from the Armenian Theory of Special Relativity by substituting $s=0$ and $g=-1$.

Where between reciprocal and direct relative velocities are the following Armenian relations:

$$\begin{cases} v' = -\dfrac{v}{1+s\frac{v}{c}} \\ v = -\dfrac{v'}{1+s\frac{v'}{c}} \end{cases} \quad \Rightarrow \quad \left(1+s\frac{v}{c}\right)\left(1+s\frac{v'}{c}\right) = 1 \tag{2-05}$$

Armenian gamma functions for direct and reciprocal relative velocities, with Armenian subscript letter չ, are:

$$\begin{cases} \gamma_{չ}(v) = \dfrac{1}{\sqrt{1+s\frac{v}{c}+g\frac{v^2}{c^2}}} > 0 \\ \gamma_{չ}(v') = \dfrac{1}{\sqrt{1+s\frac{v'}{c}+g\frac{v'^2}{c^2}}} > 0 \end{cases} \quad \Rightarrow \quad \gamma_{չ}(v)\gamma_{չ}(v') = \frac{1}{1-g\frac{vv'}{c^2}} > 0 \tag{2-06}$$

Relations between reciprocal and direct Armenian gamma functions are:

$$\begin{cases} \gamma_{չ}(v') = \gamma_{չ}(v)\left(1+s\frac{v}{c}\right) > 0 \\ \gamma_{չ}(v) = \gamma_{չ}(v')\left(1+s\frac{v'}{c}\right) > 0 \end{cases} \quad \text{also} \quad \gamma_{չ}(v')v' = -\gamma_{չ}(v)v \tag{2-07}$$

Armenian invariant interval (we are using Armenian letter է) has the following expression:

$$է^2 = (ct')^2 + s(ct')x' + gx'^2 = (ct)^2 + s(ct)x + gx^2 > 0 \tag{2-08}$$

Armenian formulas of time, length and mass changes in K and K' inertial systems are:

$$\begin{cases} t = \gamma_{չ}(v)t_0 = \dfrac{t_0}{\sqrt{1+s\frac{v}{c}+g\frac{v^2}{c^2}}} \\ l = \dfrac{l_0}{\gamma_{չ}(v)} = l_0\sqrt{1+s\frac{v}{c}+g\frac{v^2}{c^2}} \\ m = \gamma_{չ}(v)m_0 = \dfrac{m_0}{\sqrt{1+s\frac{v}{c}+g\frac{v^2}{c^2}}} \end{cases} \quad \text{and} \quad \begin{cases} t' = \gamma_{չ}(v')t_0 = \dfrac{t_0}{\sqrt{1+s\frac{v'}{c}+g\frac{v'^2}{c^2}}} \\ l' = \dfrac{l_0}{\gamma_{չ}(v')} = l_0\sqrt{1+s\frac{v'}{c}+g\frac{v'^2}{c^2}} \\ m' = \gamma_{չ}(v')m_0 = \dfrac{m_0}{\sqrt{1+s\frac{v'}{c}+g\frac{v'^2}{c^2}}} \end{cases} \tag{2-09}$$

Transformation formulas for velocities (addition and subtraction) and Armenian gamma functions are:

$$\begin{cases} u = u' \oplus v = \dfrac{u'+v+s\frac{vu'}{c}}{1-g\frac{vu'}{c^2}} \\ \gamma_{չ}(u) = \gamma_{չ}(v)\gamma_{չ}(u')\left(1-g\frac{vu'}{c^2}\right) \end{cases} \quad \text{and} \quad \begin{cases} u' = u \ominus v = \dfrac{u-v}{1+s\frac{v}{c}+g\frac{vu}{c^2}} \\ \gamma_{չ}(u') = \gamma_{չ}(v)\gamma_{չ}(u)\left(1+s\frac{v}{c}+g\frac{vu}{c^2}\right) \end{cases} \tag{2-10}$$

If we in the K inertial system use the following notations for mirror reflection of time and space coordinates:

$$\begin{cases} \bar{t} & - \quad \text{mirror reflection of time } t \\ \bar{x} & - \quad \text{mirror reflection of space } x \end{cases} \tag{2-11}$$

Then the Armenian relation between reflected $(\bar{t},\bar{x})$ and normal (t,x) time-space coordinates of the same event are:

$$\begin{cases} \bar{t} = t + \frac{1}{c} s x \\ \bar{x} = -x \end{cases} \quad \text{and} \quad \begin{cases} t = \bar{t} + \frac{1}{c} s\, \bar{x} \\ x = -\,\bar{x} \end{cases} \tag{2-12}$$

The ranges of velocity w for the free moving particle, depending on the domains of time-space constants s and g, are

$g \setminus s$	$s < 0$	$s = 0$	$s > 0$
$g < 0$	$0 < w < w_0$	$0 < w < c\sqrt{-\frac{1}{g}}$	$0 < w < w_0$
$g \geqslant 0$	$0 < w < -\frac{1}{s}c$	$0 < w < \infty$	$0 < w < \infty$

(2-13)

Where w_0 is the fixed velocity value for $g < 0$, which equals to: $w_0 = -\frac{1}{g}\left(\frac{1}{2}s + \sqrt{(\frac{1}{2}s)^2 - g}\right)c > 0$ (2-14)

Table $(2-13)$ shows that there exists four different and distinguished range of velocities w for free moving particle, which are produced by different domains of time-space constants s and g as shown in the table below:

$g < 0$ and $s = 0$	$g < 0$ and $s \neq 0$	$g \geqslant 0$ and $s < 0$	$g \geqslant 0$ and $s \geqslant 0$
$0 < w < c\sqrt{-\frac{1}{g}}$	$0 < w < w_0$	$0 < w < -\frac{1}{s}c$	$0 < w < \infty$

(2-15)

Table $(2-15)$ shows us that each distinct domains of (s, g) time-space constants corresponds to its own unique range of velocities, so therefore we can suggest that each one of them represents one of the four fundamental forces of nature with different flavours (depending on domains of s).

Armenian Relativistic Dynamics

Armenian formulas for acceleration transformations between K' and K inertial systems are:

$$\begin{cases} a' = \dfrac{1}{\gamma^3_{\text{Հ}}(v)\left(1 + s\frac{v}{c} + g\frac{vu}{c^2}\right)^3} a \\[2ex] a = \dfrac{1}{\gamma^3_{\text{Հ}}(v)\left(1 - g\frac{vu'}{c^2}\right)^3} a' \end{cases} \tag{2-16}$$

Armenian acceleration formula, which is invariant for given movement, we define as:

$$a_{\text{Հ}} = \gamma^3_{\text{Հ}}(u) a = \gamma^3_{\text{Հ}}(u') a' \tag{2-17}$$

Armenian relativistic Lagrangian function for free moving particle with velocity w is:

$$\mathcal{L}_{\text{Հ}}(w) = -\, m_0 c^2 \sqrt{1 + s\frac{w}{c} + g\frac{w^2}{c^2}} \tag{2-18}$$

Armenian relativistic energy and momentum formulas for free moving particle with velocity w are:

$$\begin{cases} E_{\text{Հ}}(w) = \gamma_{\text{Հ}}(w)\left(1 + \frac{1}{2}s\frac{w}{c}\right) m_0 c^2 = \dfrac{1 + \frac{1}{2}s\frac{w}{c}}{\sqrt{1 + s\frac{w}{c} + g\frac{w^2}{c^2}}} m_0 c^2 \\[3ex] P_{\text{Հ}}(w) = -\,\gamma_{\text{Հ}}(w)\left(\frac{1}{2}s + g\frac{w}{c}\right) m_0 c = -\,\dfrac{\frac{1}{2}s + g\frac{w}{c}}{\sqrt{1 + s\frac{w}{c} + g\frac{w^2}{c^2}}} m_0 c \end{cases} \tag{2-19}$$

First approximation of the Armenian relativistic energy and momentum formulas $(2-19)$ are:

$$\begin{cases} E_{\text{չ}}(w) \;\approx\; m_0c^2 - (g - \tfrac{1}{4}s^2)(\tfrac{1}{2}m_0w^2) \;=\; m_0c^2 + \tfrac{1}{2}m_{\text{չ}0}w^2 \\ P_{\text{չ}}(w) \;\approx\; -\tfrac{1}{2}sm_0c - (g - \tfrac{1}{4}s^2)(m_0w) \;=\; -\tfrac{1}{2}sm_0c + m_{\text{չ}0}w \end{cases} \tag{2-20}$$

Where we denote $m_{\text{չ}0}$ as the Armenian rest mass, which equals to:

$$\boxed{m_{\text{չ}0} = -(g - \tfrac{1}{4}s^2)m_0 \gtrless 0} \tag{2-21}$$

Armenian momentum formula for rest particle $(w = 0)$, which is a very new and bizarre result, is:

$$\boxed{P_{\text{չ}}(0) = -\tfrac{1}{2}sm_0c} \tag{2-22}$$

From $(2-22)$ we obtain Armenian dark energy and dark mass formulas, with Armenian subscript letter խ, and they are:

$$E_{\text{խ}} = \frac{P_{\text{չ}0}^2}{2m_0} = \tfrac{1}{8}s^2m_0c^2 = \tfrac{1}{8}s^2E_0 \qquad \text{and} \qquad m_{\text{խ}} = \tfrac{1}{8}s^2m_0 \tag{2-23}$$

Armenian energy and momentum transformation equations $(g \neq 0)$ are:

Direct transformations

$$\begin{cases} g\dfrac{E'_{\text{չ}}}{c} = \gamma_{\text{չ}}(v)\left[\left(g\dfrac{E_{\text{չ}}}{c}\right) - g\dfrac{v}{c}P_{\text{չ}}\right] \\ P'_{\text{չ}} = \gamma_{\text{չ}}(v)\left[\left(1 + s\dfrac{v}{c}\right)P_{\text{չ}} + \dfrac{v}{c}\left(g\dfrac{E_{\text{չ}}}{c}\right)\right] \end{cases}$$

and

Inverse transformations

$$\begin{cases} g\dfrac{E_{\text{չ}}}{c} = \gamma_{\text{չ}}(v)\left[\left(1 + s\dfrac{v}{c}\right)\left(g\dfrac{E'_{\text{չ}}}{c}\right) + g\dfrac{v}{c}P'_{\text{չ}}\right] \\ P_{\text{չ}} = \gamma_{\text{չ}}(v)\left[P'_{\text{չ}} - \dfrac{v}{c}\left(g\dfrac{E'_{\text{չ}}}{c}\right)\right] \end{cases} \tag{2-24}$$

From $(2-24)$ we get the following invariant Armenian relation $(g \neq 0)$:

$$\left(g\frac{E_{\text{չ}}}{c}\right)^2 + s\left(g\frac{E_{\text{չ}}}{c}\right)P_{\text{չ}} + g\left(P_{\text{չ}}\right)^2 = \left(g\frac{E'_{\text{չ}}}{c}\right)^2 + s\left(g\frac{E'_{\text{չ}}}{c}\right)P'_{\text{չ}} + g\left(P'_{\text{չ}}\right)^2 = g(g - \tfrac{1}{4}s^2)(m_0c)^2 \tag{2-25}$$

Armenian force components in K and K' inertial systems are (see full article):

$$\begin{cases} F^0_{\text{չ}} \;=\; \dfrac{d}{dt}\left(\dfrac{g}{c}E_{\text{չ}}\right) \;=\; g\dfrac{u}{c}F_{\text{չ}} \\ F_{\text{չ}} \;=\; \dfrac{d}{dt}\left(P_{\text{չ}}\right) \;=\; m_{\text{չ}0}a_{\text{չ}} \end{cases} \quad \text{and} \quad \begin{cases} F'^0_{\text{չ}} \;=\; \dfrac{d}{dt'}\left(\dfrac{g}{c}E'_{\text{չ}}\right) \;=\; g\dfrac{u'}{c}F_{\text{չ}} \\ F'_{\text{չ}} \;=\; \dfrac{d}{dt}\left(P'_{\text{չ}}\right) \;=\; m_{\text{չ}0}a_{\text{չ}} \end{cases} \tag{2-26}$$

From $(2-26)$ it follows that Armenian force space components are also invariant:

$$\boxed{F_{\text{չ}} = F'_{\text{չ}} = m_{\text{չ}0}a_{\text{չ}}} \tag{2-27}$$

As you can see $(2-15)$*, we are a few steps away to construct a unified field theory, which can change the face of modern physics as we know it now. But the final stage of the construction will come after we finish the Armenian Theory of Special Relativity in three dimensions.*

You can get our full article with all derivations, proofs and other amazing formulas (in Armenian language) via E-mail.

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3. Theoretical Foundation of Infinite Free Energy

(Armenian Theory of Asymmetric Relativity)

(Created 21 June 2014)

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Abstract

The aim of this current article is to illustrate in detail Armenian relativistic formulas and compare them with Lorentz relativistic formulas so that readers can easily differentiate these two theories and visualize how general and rich our Armenian Theory of Special Relativity really is with a spectacular build in asymmetry.

Then we are going behind this comparison and illustrating that build in asymmetry inside Armenian Theory of Special Relativity is reincarnating the ether as a universal reference frame, which is not contrary to relativity theory at all. We mathematically prove the existence of ether and we show how to extract infinite energy from the time-space or sub-atomic rest ether medium. Our theory explains all these facts and peacefully brings together followers of absolute ether theory, relativistic ether theory or followers of dark matter theory. We also mention that the absolute rest medium has a very complex geometric time-space character, which has never been seen before.

We are explaining why NASA's earlier "BPP" and DARPA's "Casimir Effect Enhancement" programs failed.

We are also stating that the time is right to reopen NASA's BPP program and fuel the spacecrafts using the everywhere existing ether asymmetric momentum force.

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Keywords:
Armenian Relativity; Lorentz Relativity; Relativistic; Transformations; Kinematics; Dynamics; Free Energy

Introduction

(*Legacy science as an organized institution dug its own grave.*)

First of all we appreciate the fact that our article "Armenian Theory of Special Relativity Letter" eventually was published in "Infinite Energy" magazine on the historic 25-th anniversary of cold fusion conference issue 115, May 2014.

The "Infinite Energy" magazine provides a forum for debate and discussion of frontier science and that’s why our article "Armenian Theory of Special Relativity" has been published in its proper place where scientists can discuss new derived generalized Lorentz-Poincare relativistic theory with new amazing relativistic formulas and find a way to harness infinite energy from time-space continuum or more precisely from the ether as a hidden sub-quantum medium.

The aim of this current article is to illustrate in detail Armenian relativistic formulas and compare them with Lorentz relativistic formulas so that readers can easily differentiate these two theories and visualize how general and rich our Armenian Theory of Special Relativity really is with a spectacular build in asymmetry.

It is worth to mention also that Lorentz transformation equations and all other Lorentz relativistic formulas can be obtained from the Armenian Theory of Special Relativity as a particular case, by substituting $s = 0$ and $g = -1$.

NASA’s earlier program (between 1996 and 2003 years) called "Breakthrough Propulsion Physics" failed because they didn’t have correct relativistic formulas. The same happened with DARPA’s "Casimir Effect Enhancement program" when trying to harness the Casimir force in a vacuum and using that energy to power a propulsion system. They didn’t succeed either because of the same reason - they did not have correct quantum mechanics theory and equations.

The time is right to reopen NASA’s BPP program, but this time using our everywhere existing ether momentum force.

In our humble opinion, using Armenian Theory of Special Relativity and it’s promising relativistic formulas - all that work can be done within two to three years, which will bring forth the dawn of a new technological era.

That’s why It is our pleasure to inform the scientific community at large, that in our main research-manuscript we have succeeded to build a mathematically solid theory of special relativity in one dimensional space and derive new transformation equations and many other new fascinating relativistic formulas, which are an unambiguous generalization of the Lorentz transformation equations and all other Lorentz relativistic formulas. Our article is the accumulation of all efforts from mathematicians and physicists to build a more general transformation equations of relativity in one dimension.

Our published manuscript creates a paradigm for advance studies in relativistic kinematics and dynamics. The crown jewel of the Armenian Theory of Special Relativity is Armenian energy and momentum formulas, which the world has never seen before. Our Armenian theory has unpredictable applications in applied physics. Such as, by manipulating the time-space numerical constants s and g (particularly in chemical or in thermal environment) we can obtain numerous mind blowing practical results, including a theoretical pointer of how to harness infinite energy from time-space continuum and how to use rest particle asymmetric momentum formula to do it.

Our manuscript would be of interest to a broad readership including those who are interested in theoretical aspects of teleportation, time travel, antigravitation, free energy and much more...

The time has come to reincarnate the ether as a universal rest reference medium which is not contrary to relativity theory. And our theory explains all these facts and peacefully brings together followers of absolute ether theory, relativistic ether theory or followers of dark matter theory.

Armenian Theory of Relativity differs from all other cold fusion researchers theories by not constructing some artificial formulas to explain the innumerous infinite energy experimental results. We instead succeeded on building a beautiful theory of relativity (in one dimension) and accordingly received many very important new formulas. Finally we mathematically proved the existence of absolute rest ether system and Armenian relativistic formulas need to guide all bright experimenters on the journey of how to extract infinite energy from the time-space or sub-atomic ether medium.

The time is right to say that 100 years of inquisition in physics is now over and Ether Energy Age has begun!

Legend of the Used Symbols

- *Fundamental physical quantities*

$$\begin{cases} t & - & \text{time coordinate notation} \\ x & - & \text{space coordinate notation} \\ \varphi & - & \text{general scalar quantity notation} \\ A & - & \text{general vector quantity notation} \\ m_{\text{Հ}0} \text{ and } m_{L0} & - & \text{Armenian and Lorentz rest masses} \\ m \text{ and } m' & - & \text{masses of the moving particle } m_0 \end{cases} \tag{3-01}$$

- *Direct and reciprocal relative velocity notations*

$$\begin{cases} v & - & \text{velocity } K' \text{ inertial system respect to the } K \text{ inertial system} \\ v' & - & \text{velocity } K \text{ inertial system respect to the } K' \text{ inertial system} \\ u & - & \text{velocity } K'' \text{ inertial system respect to the } K' \text{ inertial system} \\ u' & - & \text{velocity } K' \text{ inertial system respect to the } K'' \text{ inertial system} \\ w & - & \text{velocity } K'' \text{ inertial system respect to the } K \text{ inertial system} \\ w' & - & \text{velocity } K \text{ inertial system respect to the } K'' \text{ inertial system} \end{cases} \tag{3-02}$$

- *Acceleration notations*

$$\begin{cases} a,\ a_{\text{Հ}} \text{ and } a_L & - & \text{accelerations of the particle in the } K \text{ inertial system} \\ b,\ b_{\text{Հ}} \text{ and } b_L & - & \text{accelerations of the particle in the } K' \text{ inertial system} \end{cases} \tag{3-03}$$

- *Derived physical quantities*

$$\begin{cases} \mathcal{L}_{\text{Հ}} \text{ and } \mathcal{L}_L & - & \text{Armenian and Lorentz Lagrangian notations} \\ E_{\text{Հ}} \text{ and } E_L & - & \text{Armenian and Lorentz energy notations} \\ P_{\text{Հ}} \text{ and } P_L & - & \text{Armenian and Lorentz momentum notations} \\ F_{\text{Հ}} \text{ and } F_L & - & \text{Armenian and Lorentz force notations} \\ E_G \text{ and } P_G & - & \text{Galilean energy and momentum notations} \\ \hat{\boldsymbol{\xi}}_{\text{Հ}} \text{ and } \hat{\boldsymbol{\xi}}_L & - & \text{Armenian and Lorentz transformation matrixes} \\ \hat{\mathbf{h}}_{\text{Հ}} \text{ and } \hat{\mathbf{h}}_L & - & \text{Armenian and Lorentz mirroring matrixes} \end{cases} \tag{3-04}$$

- *Mirror reflection notations for physical quantities*

$$\begin{cases} \overset{\neg}{t} & - & \text{mirror reflection of the time quantity } t \\ \overset{\neg}{x} & - & \text{mirror reflection of the space quantity } x \\ \overset{\neg}{w} \equiv w' & - & \text{mirror velocity equals reciprocal velocity} \\ \overset{\neg}{\varphi} & - & \text{mirror reflection of the scalar quantity } \varphi \\ \overset{\neg}{A} & - & \text{mirror reflection of the vector quantity } A \\ \overset{\neg}{a},\ \overset{\neg}{a}_{\text{Հ}} \text{ and } \overset{\neg}{a}_L & - & \text{mirror reflections of the accelerations } a,\ a_{\text{Հ}} \text{ and } a_L \\ \overset{\neg}{F}_{\text{Հ}} \text{ and } \overset{\neg}{F}_L & - & \text{mirror reflections of the forces } F_{\text{Հ}} \text{ and } F_L \\ \overset{\neg}{E}_{\text{Հ}} \text{ and } \overset{\neg}{E}_L & - & \text{mirror reflections of the energies } E_{\text{Հ}} \text{ and } E_L \\ \overset{\neg}{P}_{\text{Հ}} \text{ and } \overset{\neg}{P}_L & - & \text{mirror reflections of the momentums } P_{\text{Հ}} \text{ and } P_L \end{cases} \tag{3-05}$$

Comparison Armenian and Lorentz Relativistic Formulas

Time-Space Mirror Transformation Equations (1.8 – 15, 17)[1], (12)[2]

Armenian transformations and Lorentz transformations

$$\begin{cases} \bar{t} = t + \frac{1}{c} s x \\ \bar{x} = -x \end{cases} \quad \text{and} \quad \begin{cases} \bar{t} = t \\ \bar{x} = -x \end{cases} \tag{3-06}$$

Time-Space Transformation Equations Between Moving Inertial Systems (1.8 – 25)[1], (4)[2]

- *Direct transformations*

Armenian transformations and Lorentz transformations

$$\begin{cases} t' = \gamma_{Հ}(v)\left[\left(1 + s\frac{v}{c}\right)t + g\frac{v}{c^2}x\right] \\ x' = \gamma_{Հ}(v)(x - vt) \end{cases} \quad \text{and} \quad \begin{cases} t' = \gamma_L(v)\left(t - \frac{v}{c^2}x\right) \\ x' = \gamma_L(v)(x - vt) \end{cases} \tag{3-07}$$

- *Inverse transformations*

Armenian transformations and Lorentz transformations

$$\begin{cases} t = \gamma_{Հ}(v')\left[\left(1 + s\frac{v'}{c}\right)t' + g\frac{v'}{c^2}x'\right] \\ x = \gamma_{Հ}(v')(x' - v't') \end{cases} \quad \text{and} \quad \begin{cases} t = \gamma_L(v')\left(t' - \frac{v'}{c^2}x'\right) \\ x = \gamma_L(v')(x' - v't') \end{cases} \tag{3-08}$$

General Scalar-Vector (φ, A) **Mirror Transformation Equations** (Հ1 – 16)[1]

Armenian transformations and Lorentz transformations

$$\begin{cases} \bar{\varphi} = \varphi + sA \\ \bar{A} = -A \end{cases} \quad \text{and} \quad \begin{cases} \bar{\varphi} = \varphi \\ \bar{A} = -A \end{cases} \tag{3-09}$$

General Scalar-Vector (φ, A) **Transformation Equations Between Moving Inertial Systems** (Հ1 – 17)[1]

- *Direct transformations*

Armenian transformations and Lorentz transformations

$$\begin{cases} \varphi' = \gamma_{Հ}(v)\left[\left(1 + s\frac{v}{c}\right)\varphi + g\frac{v}{c}A\right] \\ A' = \gamma_{Հ}(v)\left(A - \frac{v}{c}\varphi\right) \end{cases} \quad \text{and} \quad \begin{cases} \varphi' = \gamma_L(v)\left(\varphi - \frac{v}{c}A\right) \\ A' = \gamma_L(v)\left(A - \frac{v}{c}\varphi\right) \end{cases} \tag{3-10}$$

- *Inverse transformations*

Armenian transformations and Lorentz transformations

$$\begin{cases} \varphi = \gamma_{Հ}(v')\left[\left(1 + s\frac{v'}{c}\right)\varphi' + g\frac{v'}{c}A'\right] \\ A = \gamma_{Հ}(v')\left(A' - \frac{v'}{c}\varphi'\right) \end{cases} \quad \text{and} \quad \begin{cases} \varphi = \gamma_L(v')\left(\varphi' - \frac{v'}{c}A'\right) \\ A = \gamma_L(v')\left(A' - \frac{v'}{c}\varphi'\right) \end{cases} \tag{3-11}$$

Mirror Transformation Matrixes $(1.12-8)$[1]

Armenian mirroring matrix and Lorentz mirroring matrix

$$\hat{\mathrm{h}}_{\text{չ}} = \begin{bmatrix} 1 & s \\ 0 & -1 \end{bmatrix} \quad \text{and} \quad \hat{\mathrm{h}}_{L} = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} \tag{3-12}$$

General Scalar-Vector (φ, A) **Relative Movement Transformation Matrixes** $(1.12-7)$[1]

Armenian transformation matrix and Lorentz transformation matrix

$$\hat{\xi}_{\text{չ}} = \gamma_{\text{չ}}(v)\begin{bmatrix} 1+s\frac{v}{c} & g\frac{v}{c} \\ -\frac{v}{c} & 1 \end{bmatrix} \equiv \gamma_{\text{չ}}(v')\begin{bmatrix} 1 & -g\frac{v'}{c} \\ \frac{v'}{c} & 1+s\frac{v'}{c} \end{bmatrix} \quad \text{and} \quad \hat{\xi}_{L} = \gamma_{L}(v)\begin{bmatrix} 1 & -\frac{v}{c} \\ -\frac{v}{c} & 1 \end{bmatrix} \tag{3-13}$$

Relation Between Reciprocal and Direct Relative Velocities $(1.7-10,11)$[1], (5)[2]

Armenian relations and Lorentz relation

$$\begin{cases} v' = -\dfrac{v}{1+s\frac{v}{c}} \\ v = -\dfrac{v'}{1+s\frac{v'}{c}} \end{cases} \quad \text{and} \quad v' = -v \tag{3-14}$$

For both relations in $(3-14)$ true the following transformation:

$$(v')' = v \tag{3-15}$$

Gamma Function Formulas $(1.9-30)$[1], (6)[2]

Armenian gamma functions and Lorentz gamma function

$$\begin{cases} \gamma_{\text{չ}}(v) = \dfrac{1}{\sqrt{1+s\frac{v}{c}+g\frac{v^2}{c^2}}} > 0 \\ \gamma_{\text{չ}}(v') = \dfrac{1}{\sqrt{1+s\frac{v'}{c}+g\frac{v'^2}{c^2}}} > 0 \end{cases} \quad \text{and} \quad \gamma_{L}(v') = \gamma_{L}(v) = \dfrac{1}{\sqrt{1-\frac{v^2}{c^2}}} > 0 \tag{3-16}$$

Gamma Functions Properties $(1.9-31,32)$[1], (7)[2]

Armenian properties and Lorentz properties

$$\begin{cases} v'\gamma_{\text{չ}}(v') = -v\gamma_{\text{չ}}(v) \\ \gamma_{\text{չ}}(v') = \gamma_{\text{չ}}(v)\left(1+s\frac{v}{c}\right) > 0 \\ \gamma_{\text{չ}}(v')\left(1+\frac{1}{2}s\frac{v'}{c}\right) = \gamma_{\text{չ}}(v)\left(1+\frac{1}{2}s\frac{v}{c}\right) \end{cases} \quad \text{and} \quad \begin{cases} v'\gamma_{L}(v') = -v\gamma_{L}(v) \\ \gamma_{L}(v') = \gamma_{L}(v) > 0 \end{cases} \tag{3-17}$$

Invariant Interval Formulas $(1.9-40)$[1], (8)[2]

$$\begin{cases} \textit{Armenian interval formula} \Rightarrow \text{ե}^2 = (ct')^2 + s(ct')x' + gx'^2 = (ct)^2 + s(ct)x + gx^2 > 0 \\ \textit{Lorentz interval formula} \Rightarrow \text{ե}^2 = (ct')^2 - x'^2 = (ct)^2 - x^2 > 0 \end{cases} \tag{3-18}$$

Addition of Velocities and Gamma Function Transformations $(1.7-29,31)$[1], (10)[2]

Armenian transformations and Lorentz transformations

$$\begin{cases} w = u \oplus v = \dfrac{u+v+s\dfrac{vu}{c}}{1-g\dfrac{vu}{c^2}} \\ \gamma_{\text{Հ}}(w) = \gamma_{\text{Հ}}(v)\gamma_{\text{Հ}}(u)\left(1-g\dfrac{vu}{c^2}\right) \end{cases} \quad \text{and} \quad \begin{cases} w = u \oplus v = \dfrac{u+v}{1+\dfrac{vu}{c^2}} \\ \gamma_L(w) = \gamma_L(v)\gamma_L(u)\left(1+\dfrac{vu}{c^2}\right) \end{cases} \tag{3-19}$$

Subtraction of Velocities and Gamma Function Transformations $(1.7-30,31)$[1], (10)[2]

Armenian transformations and Lorentz transformations

$$\begin{cases} u = w \ominus v = \dfrac{w-v}{1+s\dfrac{v}{c}+g\dfrac{vw}{c^2}} \\ \gamma_{\text{Հ}}(u) = \gamma_{\text{Հ}}(v)\gamma_{\text{Հ}}(w)\left(1+s\dfrac{v}{c}+g\dfrac{vw}{c^2}\right) \end{cases} \quad \text{and} \quad \begin{cases} u = w \ominus v = \dfrac{w-v}{1-\dfrac{vw}{c^2}} \\ \gamma_L(u) = \gamma_L(v)\gamma_L(w)\left(1-\dfrac{vw}{c^2}\right) \end{cases} \tag{3-20}$$

Time and Length Changes Respect K **Inertial System** $(1.13-9,11)$[1], (9)[2]

Armenian changes and Lorentz changes

$$\begin{cases} t = \gamma_{\text{Հ}}(v)t_0 = \dfrac{t_0}{\sqrt{1+s\dfrac{v}{c}+g\dfrac{v^2}{c^2}}} \\ l = \dfrac{l_0}{\gamma_{\text{Հ}}(v)} = l_0\sqrt{1+s\dfrac{v}{c}+g\dfrac{v^2}{c^2}} \end{cases} \quad \text{and} \quad \begin{cases} t = \gamma_L(v)t_0 = \dfrac{t_0}{\sqrt{1-\dfrac{v^2}{c^2}}} \\ l = \dfrac{l_0}{\gamma_L(v)} = l_0\sqrt{1-\dfrac{v^2}{c^2}} \end{cases} \tag{3-21}$$

Time and Length Changes Respect K' **Inertial System** $(1.13-9,11)$[1], (9)[2]

Armenian changes and Lorentz changes

$$\begin{cases} t' = \gamma_{\text{Հ}}(v')t_0 = \dfrac{t_0}{\sqrt{1+s\dfrac{v'}{c}+g\dfrac{v'^2}{c^2}}} \\ l' = \dfrac{l_0}{\gamma_{\text{Հ}}(v')} = l_0\sqrt{1+s\dfrac{v'}{c}+g\dfrac{v'^2}{c^2}} \end{cases} \quad \text{and} \quad \begin{cases} t' = \gamma_L(v)t_0 = \dfrac{t_0}{\sqrt{1-\dfrac{v^2}{c^2}}} \\ l' = \dfrac{l_0}{\gamma_L(v)} = l_0\sqrt{1-\dfrac{v^2}{c^2}} \end{cases} \tag{3-22}$$

Surpluses (**Residues**) **of the Time and Length Changes** $(1.13-10,12)$[1]

Armenian surpluses and Lorentz surpluses

$$\begin{cases} (\triangle t)_{\text{Հ}} = t'-t = s\dfrac{v}{c}t = -s\dfrac{v'}{c}t' \\ (\triangle l)_{\text{Հ}} = l-l' = s\dfrac{v}{c}l' = -s\dfrac{v'}{c}l \end{cases} \quad \text{and} \quad \begin{cases} (\triangle t)_L = 0 \\ (\triangle l)_L = 0 \end{cases} \tag{3-23}$$

Accelerations Mirror Transformation Equations $(\text{Հ}2-3)$[1]

Armenian transformations and Lorentz transformation

$$\begin{cases} \overleftarrow{a} = -\dfrac{1}{\left(1+s\dfrac{w}{c}\right)^3}a \\ a = -\dfrac{1}{\left(1+s\dfrac{w'}{c}\right)^3}\overleftarrow{a} \end{cases} \quad \text{and} \quad \overleftarrow{a} = -a \tag{3-24}$$

Acceleration Transformation Equations Between Moving Inertial Systems $\left(\text{չ}2-5\right)^{\mathbf{1}},\ (16)^{\mathbf{2}}$

Armenian transformations and Lorentz transformations

$$\begin{cases} b = \dfrac{1}{\gamma_{\text{չ}}^3(v)\left(1+s\dfrac{v}{c}+g\dfrac{vw}{c^2}\right)^3}a \\ a = \dfrac{1}{\gamma_{\text{չ}}^3(v)\left(1-g\dfrac{vu}{c^2}\right)^3}b \end{cases} \quad \text{and} \quad \begin{cases} b = \dfrac{1}{\gamma_L^3(v)\left(1-\dfrac{vw}{c^2}\right)^3}a \\ a = \dfrac{1}{\gamma_L^3(v)\left(1+\dfrac{vu}{c^2}\right)^3}b \end{cases} \tag{3-25}$$

New Accelerations Definitions $\left(\text{չ}2-7\right)^{\mathbf{1}},\ (17)^{\mathbf{2}}$

Armenian accelerations and Lorentz accelerations

$$\begin{cases} a_{\text{չ}} = \gamma_{\text{չ}}^3(w)a = \gamma_{\text{չ}}^3(u)b \\ \bar{a}_{\text{չ}} = -\gamma_{\text{չ}}^3(w')\,\bar{a} = -\gamma_{\text{չ}}^3(u')\,\bar{b} \end{cases} \quad \text{and} \quad \begin{cases} a_L = \gamma_L^3(w)a = \gamma_L^3(u)b \\ \bar{a}_L = -\gamma_L^3(w')\,\bar{a} = -\gamma_L^3(u')\,\bar{b} \end{cases} \tag{3-26}$$

New Accelerations Properties $\left(\text{չ}2-8\right)^{\mathbf{1}}$

Armenian properties and Lorentz properties

$$\begin{cases} \bar{a}_{\text{չ}} = -a_{\text{չ}} \\ \left|\bar{a}_{\text{չ}}\right| = \left|a_{\text{չ}}\right| \end{cases} \quad \text{and} \quad \begin{cases} \bar{a}_L = -a_L \\ \left|\bar{a}_L\right| = \left|a_L\right| \end{cases} \tag{3-27}$$

Lagrangian Functions For Free Moving Particle $\left(\text{չ}2-22,23\right)^{\mathbf{1}},\ (18)^{\mathbf{2}}$

Armenian Lagrangian and Lorentz Lagrangian

$$\mathcal{L}_{\text{չ}}(w) = -\,m_0c^2\sqrt{1+s\frac{w}{c}+g\frac{w^2}{c^2}} \quad \text{and} \quad \mathcal{L}_L(w) = -\,m_0c^2\sqrt{1-\frac{w^2}{c^2}} \tag{3-28}$$

Lagrangian Functions Mirror Transformation Equations $\left(\text{չ}2-25\right)^{\mathbf{1}}$

Armenian transformations and Lorentz transformations

$$\begin{cases} \mathcal{L}_{\text{չ}}(w') = \dfrac{\mathcal{L}_{\text{չ}}(w)}{1+s\dfrac{w}{c}} \\ \mathcal{L}_{\text{չ}}(w) = \dfrac{\mathcal{L}_{\text{չ}}(w')}{1+s\dfrac{w'}{c}} \end{cases} \quad \text{and} \quad \begin{cases} \mathcal{L}_L(w') = \mathcal{L}_L(w) \\ \mathcal{L}_L(w) = \mathcal{L}_L(w') \end{cases} \tag{3-29}$$

Lagrangian Function Transformation Equations Between Moving Inertial Systems $\left(\text{չ}2-26\right)^{\mathbf{1}}$

Armenian Transformations and Lorentz Transformations

$$\begin{cases} \mathcal{L}_{\text{չ}}(u) = \dfrac{\sqrt{1+s\dfrac{v}{c}+g\dfrac{v^2}{c^2}}}{1+s\dfrac{v}{c}+g\dfrac{vw}{c^2}}\mathcal{L}_{\text{չ}}(w) \\ \mathcal{L}_{\text{չ}}(w) = \dfrac{\sqrt{1+s\dfrac{v}{c}+g\dfrac{v^2}{c^2}}}{1-g\dfrac{vu}{c^2}}\mathcal{L}_{\text{չ}}(u) \end{cases} \quad \text{and} \quad \begin{cases} \mathcal{L}_L(u) = \dfrac{\sqrt{1-\dfrac{v^2}{c^2}}}{1-\dfrac{vw}{c^2}}\mathcal{L}_L(w) \\ \mathcal{L}_L(w) = \dfrac{\sqrt{1-\dfrac{v^2}{c^2}}}{1+\dfrac{vu}{c^2}}\mathcal{L}_L(u) \end{cases} \tag{3-30}$$

Free Moving Particle Energy and Momentum Formulas $\left(\text{Հ}2-27\right)$[1], (19)[2]

(*The Crown Jewel of the Armenian Theory of Relativity*)

Armenian formulas and Lorentz formulas

$$\begin{cases} E_{\text{Հ}}(w) = \dfrac{1+\frac{1}{2}s\frac{w}{c}}{\sqrt{1+s\frac{w}{c}+g\frac{w^2}{c^2}}}m_0c^2 \\ P_{\text{Հ}}(w) = -\dfrac{\frac{1}{2}s+g\frac{w}{c}}{\sqrt{1+s\frac{w}{c}+g\frac{w^2}{c^2}}}m_0c \end{cases} \quad \text{and} \quad \begin{cases} E_L(w) = \dfrac{1}{\sqrt{1-\frac{w^2}{c^2}}}m_0c \\ P_L(w) = \dfrac{1}{\sqrt{1-\frac{w^2}{c^2}}}m_0w \end{cases} \tag{3-31}$$

Energy and Momentum Transformation Equations Between Moving Inertial Systems $\left(\text{Հ}2-32\right)$[1], (24)[2]

- *Direct transformations*

Armenian transformations and Lorentz Transformations

$$\begin{cases} E'_{\text{Հ}} = \gamma_{\text{Հ}}(v)\left(E_{\text{Հ}}-vP_{\text{Հ}}\right) \\ P'_{\text{Հ}} = \gamma_{\text{Հ}}(v)\left[\left(1+s\frac{v}{c}\right)P_{\text{Հ}}+g\frac{v}{c^2}E_{\text{Հ}}\right] \end{cases} \quad \text{and} \quad \begin{cases} E'_L = \gamma_L(v)(E_L-vP_L) \\ P'_L = \gamma_L(v)\left(P_L-\frac{v}{c^2}E_L\right) \end{cases} \tag{3-32}$$

- *Inverse Transformations*

Armenian transformations and Lorentz Transformations

$$\begin{cases} E_{\text{Հ}} = \gamma_{\text{Հ}}(v')\left(E'_{\text{Հ}}-v'P'_{\text{Հ}}\right) \\ P_{\text{Հ}} = \gamma_{\text{Հ}}(v')\left[\left(1+s\frac{v'}{c}\right)P'_{\text{Հ}}+g\frac{v'}{c^2}E'_{\text{Հ}}\right] \end{cases} \quad \text{and} \quad \begin{cases} E_L = \gamma_L(v)\left(E'_L+vP'_L\right) \\ P_L = \gamma_L(v)\left(P'_L+\frac{v}{c^2}E'_L\right) \end{cases} \tag{3-33}$$

Invariant (or Full) Energy-Momentum Formulas $\left(\text{Հ}2-33\right)$[1], (25)[2]

- *Armenian invariant energy-momentum formula*

$$\left(g\frac{E_{\text{Հ}}}{c}\right)^2+s\left(g\frac{E_{\text{Հ}}}{c}\right)P_{\text{Հ}}+g\left(P_{\text{Հ}}\right)^2 = \left(g\frac{E'_{\text{Հ}}}{c}\right)^2+s\left(g\frac{E'_{\text{Հ}}}{c}\right)P'_{\text{Հ}}+g\left(P'_{\text{Հ}}\right)^2 = g(g-\tfrac{1}{4}s^2)(m_0c)^2 \gtrless 0 \tag{3-34}$$

- *Lorentz invariant energy-momentum formula*

$$\left(\frac{E_L}{c}\right)^2-(P_L)^2 = \left(\frac{E'_L}{c}\right)^2-(P'_L)^2 = (m_0c)^2 > 0 \tag{3-35}$$

Energy and Momentum Mirror Reflection Formulas $\left(\text{Հ}2-28\right)$[1]

Armenian formulas and Lorentz formulas

$$\begin{cases} \overleftarrow{E}_{\text{Հ}} = E_{\text{Հ}} \\ \overleftarrow{P}_{\text{Հ}}+P_{\text{Հ}} = -s\frac{1}{c}E_{\text{Հ}} \end{cases} \quad \text{and} \quad \begin{cases} \overleftarrow{E}_L = E_L \\ \overleftarrow{P}_L+P_L = 0 \end{cases} \tag{3-36}$$

Time and length change formulas in $(3-21)$ and $(3-22)$ was derived in our manuscript, therefore they're correct. We have not yet succeeded in deriving the correct formula for representing a moving particles mass change, therefore we need to decide which formula of mass change is a more proper choice, until we find the way to derive it or make an experiment to find the right formula. There are three logical choices: first choice is to go the legacy relativity way and the other two choices follows directly from the Armenian energy and momentum formulas. All those three choices can be seen below:

$$
\begin{cases}
1) \ \text{Legacy relativity way} & \Rightarrow \quad m = \gamma_{\text{չ}}(w) m_0 \\
2) \quad E_{\text{չ}} = mc^2 & \Rightarrow \quad m = \dfrac{E_{\text{չ}}}{c^2} = \gamma_{\text{չ}}(w)\left(1 + \tfrac{1}{2} s \dfrac{w}{c}\right) m_0 \\
3) \quad P_{\text{չ}} = mw & \Rightarrow \quad m = \dfrac{P_{\text{չ}}}{w} = -\gamma_{\text{չ}}(w) \left(\dfrac{\tfrac{1}{2} s + g \frac{w}{c}}{\frac{w}{c}} \right) m_0
\end{cases}
\tag{3-37}
$$

We need to analyze these three choices separately and then calculate the mass surpluses for these three cases. For legacy relativity, all these three cases coincide with each other and therefore, there is no contradiction at all.

Mass Changes Respect K **and** K' **Inertial Systems** $(1.13-13,14)^{\mathbf{1}}, (9)^{\mathbf{2}}$

1. *First choice*

Armenian changes of the moving mass m_0 and Lorentz changes of the moving mass m_0

$$
\begin{cases}
m = \dfrac{m_0}{\sqrt{1 + s \frac{w}{c} + g \frac{w^2}{c^2}}} \\[2ex]
m' = \dfrac{m_0}{\sqrt{1 + s \frac{w'}{c} + g \frac{w'^2}{c^2}}}
\end{cases}
\quad \text{and} \quad
\begin{cases}
m = \dfrac{m_0}{\sqrt{1 - \frac{w^2}{c^2}}} \\[2ex]
m' = \dfrac{m_0}{\sqrt{1 - \frac{w^2}{c^2}}}
\end{cases}
\tag{3-38}
$$

Surpluses of the mass for this case

Armenian surplus and Lorentz surplus

$$
(\triangle m)_{\text{չ}} = m' - m = s \frac{w}{c} m = -s \frac{w'}{c} m' \quad \text{and} \quad (\triangle m)_L = m' - m = 0
\tag{3-39}
$$

2. *Second choice*

Armenian changes of the moving mass m_0 and Lorentz changes of the moving mass m_0

$$
\begin{cases}
m = \dfrac{1 + \frac{1}{2} s \frac{w}{c}}{\sqrt{1 + s \frac{w}{c} + g \frac{w^2}{c^2}}} m_0 \\[2ex]
m' = \dfrac{1 + \frac{1}{2} s \frac{w'}{c}}{\sqrt{1 + s \frac{w'}{c} + g \frac{w'^2}{c^2}}} m_0
\end{cases}
\quad \text{and} \quad
\begin{cases}
m = \dfrac{m_0}{\sqrt{1 - \frac{w^2}{c^2}}} \\[2ex]
m' = \dfrac{m_0}{\sqrt{1 - \frac{w^2}{c^2}}}
\end{cases}
\tag{3-40}
$$

Surpluses of the mass changes for this case

Armenian surplus and Lorentz surplus

$$
(\triangle m)_{\text{չ}} = m' - m = 0 \quad \text{and} \quad (\triangle m)_L = m' - m = 0
\tag{3-41}
$$

3. *Third choice*

Armenian changes of the moving mass m_0 and Lorentz changes of the moving mass m_0

$$
\begin{cases}
m = -\dfrac{\left(\frac{c}{w}\right)\left(\frac{1}{2} s + g \frac{w}{c}\right)}{\sqrt{1 + s \frac{w}{c} + g \frac{w^2}{c^2}}} m_0 \\[2ex]
m' = -\dfrac{\left(\frac{c}{w'}\right)\left(\frac{1}{2} s + g \frac{w'}{c}\right)}{\sqrt{1 + s \frac{w'}{c} + g \frac{w'^2}{c^2}}} m_0
\end{cases}
\quad \text{and} \quad
\begin{cases}
m = \dfrac{m_0}{\sqrt{1 - \frac{w^2}{c^2}}} \\[2ex]
m' = \dfrac{m_0}{\sqrt{1 - \frac{w^2}{c^2}}}
\end{cases}
\tag{42}
$$

Surpluses of the mass changes for this case

Armenian surplus and Lorentz surplus

$$(\triangle m)_{\text{է}} = m' - m = \gamma_{\text{է}}(w)\left(1 + s\frac{w}{c}\right)\frac{\frac{1}{2}s + (\frac{1}{2}s^2 - g)\frac{w}{c}}{\frac{w}{c}}m_0 \quad \text{and} \quad (\triangle m)_L = m' - m = 0 \tag{3-43}$$

The mass of the moving particle is not an important quantity anymore. The more important quantity becomes the particle's rest mass m_0 which has a real physical meaning. In Armenian Theory of Relativity we also define a new rest mass quantity, which is more general and can also have a negative value as well, just like a particle's charge.

Rest Mass Formulas $(\text{է}2 - 9)$[1], (21)[2]

Armenian rest mass and Lorentz rest mass

$$m_{\text{է}0} = -(g - \tfrac{1}{4}s^2)m_0 \lesseqgtr 0 \quad \text{and} \quad m_{L0} = m_0 > 0 \tag{3-44}$$

Force Formulas $(\text{է}2 - 7, 10)$[1], (26)[2]

Armenian force formula and Lorentz force formula

$$\begin{cases} F_{\text{է}} = -(g - \frac{1}{4}s^2)m_0\gamma_{\text{է}}^3(w)a = m_{\text{է}0}a_{\text{է}} \\ \bar{F}_{\text{է}} = -(g - \frac{1}{4}s^2)m_0\gamma_{\text{է}}^3(w')\,\bar{a} = m_{\text{է}0}\,\bar{a}_{\text{է}} \end{cases} \quad \text{and} \quad \begin{cases} F_L = m_0\gamma_L^3(w)a = m_0 a_L \\ \bar{F}_L = m_0\gamma_L^3(w')\,\bar{a} = m_0\,\bar{a}_L \end{cases} \tag{3-45}$$

Force Transformation Formulas Between Moving Inertial Systems $(\text{է}2 - 40)$[1], (27)[2]

Preserved Newton's laws, Armenian formulas and Lorentz formulas

$$\begin{cases} \text{Newton's second law} \\ \text{Newton's third law} \end{cases} \Rightarrow \begin{cases} F_{\text{է}} = F'_{\text{է}} \\ \bar{F}_{\text{է}} = -F_{\text{է}} \end{cases} \quad \text{and} \quad \begin{cases} F_L = F'_L \\ \bar{F}_L = -F_L \end{cases} \tag{3-46}$$

Rest Particle Energy and Momentum Formulas Progress Chronicle (**very important**!) (22)[2]

Galilean formulas		Lorentz formulas		Armenian formulas
$E_G(0) = 0$	$\Rightarrow$	$E_L(0) = m_0c^2$ ✓	$\Rightarrow$	$E_{\text{է}}(0) = m_0c^2$ ✓
$P_G(0) = 0$		$P_L(0) = 0$		$P_{\text{է}}(0) = -\frac{1}{2}sm_0c$ ✠

(3-47)

✓ - This rest particle energy formula gives us nuclear power.
✠ - This rest particle momentum formula is the Armenium formula - gift to mankind as a clean and free energy source.

Range of Velocities of Moving Particle in the Armenian Theory of Relativity $(1.11 - 79)$[1], $(13, 14, 15)$[2]

$g \setminus s$	$s < 0$	$s = 0$	$s > 0$
$g < 0$	$0 < w < w_0$	$0 < w < c\sqrt{-\frac{1}{g}}$	$0 < w < w_0$
$g = 0$	$0 < w < -\frac{1}{s}c$	$0 < w < \infty$	$0 < w < \infty$
$0 < g < (\frac{1}{2}s)^2$	$0 < w < -\frac{1}{s}c$	$0 < w < \infty$	$0 < w < \infty$
$g \geqslant (\frac{1}{2}s)^2$	$0 < w < -\frac{1}{s}c$	$0 < w < \infty$	$0 < w < \infty$

(3-48)

Conclusions

As you can see from the above comparisons of Armenian and Lorentz relativistic formulas, Armenian relativistic formulas is full of asymmetry, which is in every single formula because of coefficient asymmetry s and that asymmetry is the essence and exciting part of the Armenian Theory of Relativity. Therefore we define a brand new geometrical space - Armenian Space to satisfy Armenian Theory of Special Relativity, with very "strange" properties in three dimensions, such as:

$$\boxed{\vec{\mathbf{i}}_\alpha \cdot \vec{\mathbf{i}}_\beta \neq \vec{\mathbf{i}}_\beta \cdot \vec{\mathbf{i}}_\alpha \qquad \text{and} \qquad \vec{\mathbf{i}}_\alpha \times \vec{\mathbf{i}}_\alpha = s_\alpha \vec{\mathbf{i}}_\alpha} \tag{3-49}$$

Analyzing the crown jewel of the Armenian Theory of Relativity - the Armenian energy and momentum formulas $(3-31)$, we find out that the free moving particle with velocity w in the inertial system K has the following three extreme situations:

$$\begin{cases} 1) \ \text{moving particle's velocity equals zero} & - \quad w = 0 \\ 2) \ \text{moving particle's energy equals zero} & - \quad E_{\zeta}(w) = 0 \\ 3) \ \text{moving particle's momentum equals zero} & - \quad P_{\zeta}(w) = 0 \end{cases} \tag{3-50}$$

For these three cases $(3-50)$ the particle has different velocities and accordingly, using $(3-16)$, we have three different values of Armenian gamma function as shown below:

$$\begin{cases} 1) \ w = 0 & \Rightarrow \quad \gamma_{\zeta}(0) = 1 \\ 2) \ w = -\frac{2}{s}c = w_1 & \Rightarrow \quad \gamma_{\zeta}(w_1) = \dfrac{\frac{1}{2}s}{\sqrt{g - \frac{1}{4}s^2}} \\ 3) \ w = -\frac{1}{2}\frac{s}{g}c = w_2 & \Rightarrow \quad \gamma_{\zeta}(w_2) = \dfrac{1}{\sqrt{1 - \frac{1}{4}\frac{s^2}{g}}} \end{cases} \tag{3-51}$$

Therefore using the velocity and Armenian gamma function values given by $(3-51)$, we can obtain from $(3-31)$ the particle's Armenian energy and Armenian momentum values for these three extreme cases:

$$\begin{cases} 1) \ E_{\zeta}(0) = m_0c^2 & \text{and} \quad P_{\zeta}(0) = -\frac{1}{2}sm_0c \\ 2) \ E_{\zeta}(w_1) = 0 & \text{and} \quad P_{\zeta}(w_1) = \left(\sqrt{g - \frac{1}{4}s^2}\right)m_0c \\ 3) \ E_{\zeta}(w_2) = \left(\sqrt{1 - \frac{1}{4}\frac{s^2}{g}}\right)m_0c^2 & \text{and} \quad P_{\zeta}(w_2) = 0 \end{cases} \tag{3-52}$$

How can we explain all of these strange results, which is unthinkable from the legacy physics point of view? What is really the physical meanings of the following three cases?

1) When a particle is resting in the inertial system K $(w = 0)$, but particle still has a momentum.

2) When a particle is moving at velocity w_1 with respect to the inertial system K, but it's energy equals zero.

3) When particle moves with respect to the inertial system K at velocity w_2, but this time it's momentum equal zero.

Most physicists today would view all of these bizarre results - straight results of the Armenian Theory of Relativity, as complete madness and they will say that all these facts would bring the end of physics as we know it.

Till now due to extreme dogmatism, the properties of time-space asymmetry and all physical quantities asymmetric transformations are never “officially” studied. The role of symmetry violations in physics is not understood by physicists.

That is where the Armenian Theory of Relativity explains all of these "impossible violations" and brings to question all physical laws of legacy hard science and demands a revision under these remarkable new circumstances.

For example, in the first case - the velocity of the particle equals zero, which means that the particle is at rest in the inertial system K, but the same particle still has momentum which is dependent on coefficient s. There is only one logical explanation - that there exists an absolute rest ether medium and that the ether is silently dragging the particle back in the opposite direction of the movement inertial system K. We can harness infinite energy from that rest particle's momentum just as we are harnessing energy from the wind using a windmill.

In the same manner we can explain the third case, but the second case is a bit of a challenge.

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4. Time and Space Reversal Problems In Armenian Theory of Relativity

(In One Dimensional Space)

(Created 21 December 2014)

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Abstract

In this current article we are analyzing in detail T-symmetry (time reversal transformation) and P-symmetry (spatial coordinates inverse transformations) phenomenons in Armenian Theory of Relativity in one dimensional physical space. For that purpose we are referring and using our previous articles results. Especially in the case of research mirror reflection phenomena (spatial inversion) we are mostly referring to our main research, published by Yerevan State University in Armenia, June 2013 (86 pages).

We are delighted to know that Armenian Theory of Relativity has passed the first phase of total ridicule and now is in the phase of active discussion in scientific communities across the world. This article can be considered as an answer to the physicists who criticize the Armenian Theory of Relativity by saying that the Armenian relativistic transformations and formulas are not an invariant under time-reversal transformation and therefore Armenian Theory of Relativity is wrong.

In the first section of our article we are showing that in the case of time-reversal, Armenian Theory of Relativity is in full agreement with legacy physics and therefore our opponents criticisms in that matter are baseless.

In the case of spatial inversion (in our case mirror reflection) Armenian Theory of Relativity does not contradict in quality with legacy physics either, but gives more detailed and fine description of that phenomena, which in the macro-world is mostly unobservable but in the micro-world it plays a very significant role.

Our received results can explain many parity irregularities in elementary particle physics, especially the violation parity process in weak interactions.

PACS: 03.30. +p

Keywords:
Armenian Relativity; Lorentz Relativity; Relativistic Transformations; Time Reversal; Space Reversal; Free Energy

Introduction

Scientists examine symmetry properties of the Universe to solve problems and to search for new understandings of the physical laws governing the behavior of matter of the world around us (both macro and micro). That is what we are doing in our new Armenian Theory of Relativity.

If we like effectively present our article and explain only time-reversal phenomena or only space-reversal phenomena or both - time-reversal and space-reversal phenomenons together, then we really need to understand the physical meanings these two different phenomenons. It is worth to mention that in one dimensional space-reversal phenomena is equivalent to the mirror reflection phenomena, which is the main content of our article.

Time-reversal phenomena has many philosophical complexities such as time travel and so on, but its physical meaning is a very simple mathematical action which is leaves the physical formula unchanged or negates the formula. Also we need to mention that all fundamental physical quantities, which are not derived from time, stays unchanged such as test particle spatial coordinates $(x \to x)$, masses $(m \to m)$ and charges $(q \to q)$. Therefore in all legacy physics formulas beside negating time and keeping unchanged test particle spatial coordinates, masses and charges, we also need to negate the physical quantities, which have been derived by odd order differentiating by time of spatial coordinates. For example we need to negate the sign of all velocities $(u \to -u)$. On the contrary, if physical quantities which have been derived by even order derivation of spatial coordinates by time, must stay unchanged such as the test particle acceleration $(a \to a)$.

Spatial coordinates inversion, which in our article means mirror reflection action about x axis, is surprisingly becoming more complex physical phenomena than time-reversal phenomena. And if we like to fully to understand parity-reversal phenomena physical meanings and describe it mathematically, we need to define idea of opposite inertial systems. Afterward all Armenian relativistic formulas need to be rewritten according to the new defined direct and opposite inertial systems and then find relation between those two formulas.

First we will investigate in detail the time-reversal phenomena case and then shift all our attention to spatial-inversion (mirror-reflection) phenomena in Armenian Theory of Relativity.

Contrary to Lorentz theory of relativity, Armenian Theory of Relativity is reacher because of two new time-space characterizing s and g coefficients. Therefore except the above mentioned concern, in time-reversal and mirror-reflection cases, we also need to simultaneously make the following changes.

a) *In the time-reversal case in Armenian Theory of Relativity we need also to negate the sign of coefficient* s *and leave the sign of coefficient of* g *unchanged. So we need to make the following substitutions:* $(s \to -s)$ *and* $(g \to g)$.

b) *In the mirror-reflection case in Armenian Theory of Relativity we need to leave both* s *and* g *time-space constants unchanged:* $(s \to s)$ *and* $(g \to g)$.

We like also to emphasize that we did not denote coefficient s with that letter by accident, but by design, because it is the spin-like quantity in Macro World, which in the third dimensions world represent as real vector. But in the Micro World that coefficient s in reality represents the spin of the test particle. We like to remind you that in quantum mechanics, in the case of time-reversal, the spin sign is negated and in case of mirror reflection the spin sign is left unchanged. Therefore we can conclude that everything is in complete harmony with legacy physics.

In the end we like to remind that all legacy physics (classical and relativistic) transformations and formulas can be obtained from Armenian Theory of Relativity as a particular case by substituting $s = 0$ and $g = -1$.

Only Time Reversal Phenomena Consideration

First lets write down all quantities of legacy mechanics, which in the case of time-reversal their sign stays invariant or their sign is negate. Below you can see those physical quantities.

- *The signs of the following physical quantities of legacy mechanics stays invariant*

$$\begin{cases} \text{The mass of the test particle} & - \quad m \rightarrow m \\ \text{The position of the test particle} & - \quad \vec{r} \rightarrow \vec{r} \\ \text{The acceleration of the test particle} & - \quad \vec{a} \rightarrow \vec{a} \\ \text{The energy of the test particle} & - \quad E \rightarrow E \\ \text{The force on the test particle} & - \quad \vec{F} \rightarrow \vec{F} \end{cases} \tag{4-01}$$

- *The signs of the following physical quantities of legacy mechanics are negated*

$$\begin{cases} \text{The time when an event occurs} & - \quad t \rightarrow -t \\ \text{The velocity of the test particle} & - \quad \vec{u} \rightarrow -\vec{u} \\ \text{The linear momentum of the test particle} & - \quad \vec{P} \rightarrow -\vec{P} \\ \text{The angular momentum of the test particle} & - \quad \vec{l} \rightarrow -\vec{l} \\ \text{The spin of the test particle} & - \quad \vec{s} \rightarrow -\vec{s} \end{cases} \tag{4-02}$$

Now we need to show that in one dimensional Armenian Theory of Relativity, in the case of time-reversal, all physical quantities properties given by the table $(4-01)$ and $(4-02)$ are conserved. For that purpose in all Armenian transformations equations and Armenian relativistic formulas we need to negate the time $(t \rightarrow -t)$ and also to make the following operations related with time-reversal.

$$\begin{cases} \text{We need to negate all velocities in all inertial systems} & - \quad u \rightarrow -u \\ \text{We need to keep the accelerations unchanged in all inertial systems} & - \quad a \rightarrow a \\ \text{We need to negate the new time-space constant } s \text{ in all inertial systems} & - \quad s \rightarrow -s \\ \text{We need to keep the new time-space constant } g \text{ unchanged in all inertial systems} & - \quad g \rightarrow g \end{cases} \tag{4-03}$$

Now using the time-reversal operation given by table $(4-03)$, we try to test one by one all transformations and relativistic formulas derived by Armenian Theory of Relativity.

- *In the case of time-reversal operation, reciprocal velocity formula stays invariant* $(1.7-10)^1$, $(5)^2$, $(14)^3$

$$(-v') = -\frac{(-v)}{1+(-s)\frac{(-v)}{c}} \qquad \Rightarrow \qquad v' = -\frac{v}{1+s\frac{v}{c}} \tag{4-04}$$

- *In the case of time-reversal operation, Armenian gamma function quantity stays invariant* $(6)^2$, $(16)^3$

$$\gamma_{չ}(-v) = \frac{1}{\sqrt{1+(-s)\frac{(-v)}{c}+g\frac{(-v)^2}{c^2}}} = \frac{1}{\sqrt{1+s\frac{v}{c}+g\frac{v^2}{c^2}}} = \gamma_{չ}(v) \tag{4-05}$$

- *In the case of time-reversal operation, Armenian time-space interval stays invariant* $(8)^2$, $(18)^3$

$$\text{Ե}^2(-t,x) = (-ct)^2 + (-s)(-ct)x + gx^2 = (ct)^2 + s(ct)x + gx^2 = \text{Ե}^2(t,x) \tag{4-06}$$

- *In the case of time-reversal operation, the mathematical form of the time-space coordinates Armenian transformation equations stays invariant* $(4)^2$, $(07)^3$

$$\begin{cases} (-t') = \gamma_{\text{չ}}(-v)\left\{\left[1 + (-s)\dfrac{(-v)}{c}\right](-t) + g\dfrac{(-v)}{c^2}x\right\} \\ \\ x' = \gamma_{\text{չ}}(-v)[x - (-v)(-t)] \end{cases} \Rightarrow \begin{cases} t' = \gamma_{\text{չ}}(v)\left[\left(1 + s\dfrac{v}{c}\right)t + g\dfrac{v}{c^2}x\right] \\ \\ x' = \gamma_{\text{չ}}(v)(x - vt) \end{cases} \tag{4-07}$$

- *In the case of time-reversal operation, addition and subtraction formulas of velocities stays invariant* $(10)^2$, $(19,20)^3$

$$\begin{cases} (-u) = \dfrac{(-u') + (-v) + (-s)\dfrac{(-v)(-u')}{c}}{1 - g\dfrac{(-v)(-u')}{c^2}} \\ \\ (-u') = \dfrac{(-u) - (-v)}{1 + (-s)\dfrac{(-v)}{c} + g\dfrac{(-v)(-u)}{c^2}} \end{cases} \Rightarrow \begin{cases} u = \dfrac{u' + v + s\dfrac{vu'}{c}}{1 - g\dfrac{vu'}{c^2}} \\ \\ u' = \dfrac{u - v}{1 + s\dfrac{v}{c} + g\dfrac{vu}{c^2}} \end{cases} \tag{4-08}$$

- *In the case of time-reversal operation, Armenian Lagrangian formula stays invariant* $(18)^2$, $(28)^3$

$$\mathcal{L}_{\text{չ}}(-u) = -m_0c^2\sqrt{1 + (-s)\frac{(-u)}{c} + g\frac{(-u)^2}{c^2}} = -m_0c^2\sqrt{1 + s\frac{u}{c} + g\frac{u^2}{c^2}} = \mathcal{L}_{\text{չ}}(u) \tag{4-09}$$

- *In the case of time-reversal operation, Armenian Lagrangian function transformations stays invariant* $(30)^3$

$$\begin{cases} \mathcal{L}_{\text{չ}}(-u') = \dfrac{\sqrt{1 + (-s)\dfrac{(-v)}{c} + g\dfrac{(-v)^2}{c^2}}}{1 + (-s)\dfrac{(-v)}{c} + g\dfrac{(-v)(-u)}{c^2}}\mathcal{L}_{\text{չ}}(-u) \\ \\ \mathcal{L}_{\text{չ}}(-u) = \dfrac{\sqrt{1 + (-s)\dfrac{(-v)}{c} + g\dfrac{(-v)^2}{c^2}}}{1 - g\dfrac{(-v)(-u')}{c^2}}\mathcal{L}_{\text{չ}}(-u') \end{cases} \Rightarrow \begin{cases} \mathcal{L}_{\text{չ}}(u') = \dfrac{\sqrt{1 + s\dfrac{v}{c} + g\dfrac{v^2}{c^2}}}{1 + s\dfrac{v}{c} + g\dfrac{vu}{c^2}}\mathcal{L}_{\text{չ}}(u) \\ \\ \mathcal{L}_{\text{չ}}(u) = \dfrac{\sqrt{1 + s\dfrac{v}{c} + g\dfrac{v^2}{c^2}}}{1 - g\dfrac{vu'}{c^2}}\mathcal{L}_{\text{չ}}(u') \end{cases} \tag{4-10}$$

- *In the case of time-reversal operation, Armenian energy quantity stays invariant* $(19)^2$, $(31)^3$

$$E_{\text{չ}}(-u) = \gamma_{\text{չ}}(-u)\left[1 + \frac{1}{2}(-s)\frac{(-u)}{c}\right]m_0c^2 = \gamma_{\text{չ}}(u)\left(1 + \tfrac{1}{2}s\frac{u}{c}\right)m_0c^2 = E_{\text{չ}}(u) \tag{4-11}$$

- *In the case of time-reversal operation, the sign of the Armenian linear momentum formula is negated* $(19)^2$, $(31)^3$

$$P_{\text{չ}}(-u) = -\gamma_{\text{չ}}(-u)\left[\frac{1}{2}(-s) + g\frac{(-u)}{c}\right]m_0c = +\gamma_{\text{չ}}(u)\left(\tfrac{1}{2}s + g\frac{u}{c}\right)m_0c = -P_{\text{չ}}(u) \tag{4-12}$$

◆ *In the case of time-reversal operation, relation between Armenian energy and Armenian linear momentum* *stays invariant* $(25)^2$, $(34)^3$

$$\left[g\frac{1}{c}E_{\text{չ}}(-u)\right]^2+(-s)\left[g\frac{1}{c}E_{\text{չ}}(-u)\right]P_{\text{չ}}(-u)+gP^2_{\text{չ}}(-u)=g\left[g-\tfrac{1}{4}(-s)^2\right](m_0c)^2 \quad \Rightarrow$$
$$\Rightarrow \quad \left[g\frac{1}{c}E_{\text{չ}}(u)\right]^2+s\left[g\frac{1}{c}E_{\text{չ}}(u)\right]P_{\text{չ}}(u)+gP^2_{\text{չ}}(u)=g(g-\tfrac{1}{4}s^2)(m_0c)^2 \tag{4-13}$$

◆ *In the case of time-reversal operation, Armenian energy-momentum transformation equations* *stays invariant* $(24)^2$, $(32,33)^3$

$$\begin{cases} E_{\text{չ}}(-u')=\gamma_{\text{չ}}(-v)\left[E_{\text{չ}}(-u)-(-v)P_{\text{չ}}(-u)\right] \\ P_{\text{չ}}(-u')=\gamma_{\text{չ}}(-v)\left\{\left[1+(-s)\dfrac{(-v)}{c}\right]P_{\text{չ}}(-u)+g\dfrac{(-v)}{c^2}E_{\text{չ}}(-u)\right\} \end{cases} \quad \Rightarrow$$
$$\Rightarrow \quad \begin{cases} E_{\text{չ}}(u')=\gamma_{\text{չ}}(v)\left[E_{\text{չ}}(u)-vP_{\text{չ}}(u)\right] \\ P_{\text{չ}}(u')=\gamma_{\text{չ}}(v)\left[\left(1+s\dfrac{v}{c}\right)P_{\text{չ}}(u)+g\dfrac{v}{c^2}E_{\text{չ}}(u)\right] \end{cases} \tag{4-14}$$

◆ *In the case of time-reversal operation, Armenian spatial (Newtonian) force derivation formula* *stays invariant* $(\text{չ}2-35)^1$

$$F_{\text{չ}}(-u)=\frac{dP_{\text{չ}}(-u)}{d(-t)}=\frac{-dP_{\text{չ}}(u)}{-dt}=\frac{dP_{\text{չ}}(u)}{dt}=F_{\text{չ}}(u) \tag{4-15}$$

◆ *In the case of time-reversal operation, Armenian spatial (Newtonian) force quantity* *stays invariant* $(\text{չ}2-37)^1$, $(45)^3$

$$F_{\text{չ}}(-u)=-\left[g-\tfrac{1}{4}(-s)^2\right]m_0\gamma^3_{\text{չ}}(-u)a=-(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{չ}}(u)a=F_{\text{չ}}(u) \tag{4-16}$$

◆ *In the case of time-reversal operation, the sign of the scalar component of the Armenian force derivation formula is* *negated* $(\text{չ}2-36)^1$

$$F^0_{\text{չ}}(-u)=\frac{1}{c}\frac{dE_{\text{չ}}(-u)}{d(-t)}=\frac{1}{c}\frac{dE_{\text{չ}}(u)}{-dt}=-\frac{1}{c}\frac{dE_{\text{չ}}(u)}{dt}=-F^0_{\text{չ}}(u) \tag{4-17}$$

◆ *In the case of time-reversal operation, the sign of the scalar component of the Armenian force quantity is* *negated* $(\text{չ}2-38)^1$

$$F^0_{\text{չ}}(-u)=-\left[g-\frac{1}{4}(-s)^2\right]m_0\frac{(-u)}{c}\gamma^3(-u)a=+\left(g-\frac{1}{4}s^2\right)m_0\frac{u}{c}\gamma^3(u)a=-F^0_{\text{չ}}(u) \tag{4-18}$$

Remark 1 - *Dear readers, if we missed any transformation equations or any relativistic formulas, we hope that you can easily use* $(4-03)$ *and make time-reversal operation, to prove that particular formula stays invariant or has the sign negated.*

Definition of Opposite Inertial Systems and Only Space Reversal Phenomena Consideration

Now again lets write down all quantities of legacy mechanics, which in case of spatial-inversion (in our article mirror reflection case about x axis) either stays invariant or changes its sign. Below you can see those physical quantities.

- *The following physical quantities of legacy mechanics stays invariant*

$$\begin{cases} \text{The time when an event occurs} & - & t \to t \\ \text{The mass of the test particle} & - & m \to m \\ \text{The energy of the test particle} & - & E \to E \\ \text{The angular momentum of the test particle} & - & \vec{l} \to \vec{l} \\ \text{The spin of the test particle} & - & \vec{s} \to \vec{s} \end{cases} \tag{4-19}$$

- *The following physical quantities of legacy mechanics are have their signs negated*

$$\begin{cases} \text{The position of the test particle} & - & \vec{r} \to -\vec{r} \\ \text{The velocity of the test particle} & - & \vec{u} \to -\vec{u} \\ \text{The acceleration of the test particle} & - & \vec{a} \to -\vec{a} \\ \text{The linear momentum of the test particle} & - & \vec{P} \to -\vec{P} \\ \text{The force on the test particle} & - & \vec{F} \to -\vec{F} \end{cases} \tag{4-20}$$

In the case of space reversal, Armenian transformation equations and formulas in general do not contradict the physical quantity properties of legacy mechanics given by table $(4-19)$ and $(4-20)$. However Armenian relativistic formulas gives more detailed and fine description of that phenomena, which in the macro-world is mostly unobservable but in the micro-world plays a very significant role.

Now if we like to test all Armenian transformation equations and relativistic formulas for this space-reversal case, we first need to define the idea of opposite inertial systems and accordingly use this new notations for all physical quantities and that way we can easily to distinguish in future that they are locating in direct (not reversal) world or they are locating in opposite (in reversal) world.

Lets assume given K inertial system, which we can conventionally call the direct inertial system. Now on the origin of that inertial system, we place a two sided mirror perpendicular to the x axis, which can simultaneously reflect positive and negative parts of the axis. That means that the positive axis of the direct inertial system K becomes a negative axis and the negative axis becomes a positive axis. This newly received inertial system becomes the total inversion of the given inertial system K, which we call the opposite inertial system. Then to distinguish these two inertial systems: direct inertial system and opposite (inverted) inertial system, in Armenian Theory of Relativity we use the following notations $(1.8-2)$[1]:

$$\begin{cases} \text{For direct inertial system } K & \to & \overrightarrow{K} \\ \text{For opposite (inverted) inertial system } K & \to & \overleftarrow{K} \end{cases} \tag{4-21}$$

In order to be able to distinguish moving test particles all physical quantities in the direct inertial system $\overrightarrow{K}$ and in the opposite inertial system $\overleftarrow{K}$ we need to implement the following notations.

- *In Armenian Kinematics* $(1.8-3,4)^1$

$$\underline{\text{In the } \overrightarrow{K} \text{ direct inertial system}} \qquad\qquad \underline{\text{In the } \overleftarrow{K} \text{ opposite inertial system}}$$

$$\begin{cases} \text{For time} & \rightarrow & \overrightarrow{t} \\ \text{For spatial position} & \rightarrow & \overrightarrow{x} \\ \text{For velocity} & \rightarrow & \overrightarrow{u} = \dfrac{d\overrightarrow{x}}{d\overrightarrow{t}} \\ \text{For acceleration} & \rightarrow & \overrightarrow{a} = \dfrac{d\overrightarrow{u}}{d\overrightarrow{t}} \\ \text{For Armenian interval} & \rightarrow & \overrightarrow{\text{ե}} \end{cases} \Leftrightarrow \begin{cases} \text{For time} & \rightarrow & \overleftarrow{t} \\ \text{For spatial position} & \rightarrow & \overleftarrow{x} \\ \text{For velocity} & \rightarrow & \overleftarrow{u} = \dfrac{d\overleftarrow{x}}{d\overleftarrow{t}} \\ \text{For acceleration} & \rightarrow & \overleftarrow{a} = \dfrac{d\overleftarrow{u}}{d\overleftarrow{t}} \\ \text{For Armenian interval} & \rightarrow & \overleftarrow{\text{ե}} \end{cases} \qquad (4\text{-}22)$$

- *In Armenian Dynamics* $(\text{չ}2)^1$

$$\underline{\text{In the } \overrightarrow{K} \text{ direct inertial system}} \qquad\qquad \underline{\text{In the } \overleftarrow{K} \text{ opposite inertial system}}$$

$$\begin{cases} \text{For action integral} & \rightarrow & \overrightarrow{\text{Ե}}_{\text{չ}} \\ \text{For Armenian Lagrangian} & \rightarrow & \overrightarrow{\mathcal{L}}_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\overrightarrow{u}\right) \\ \text{For Armenian energy} & \rightarrow & \overrightarrow{E}_{\text{չ}} = E_{\text{չ}}\left(\overrightarrow{u}\right) \\ \text{For Armenian momentum} & \rightarrow & \overrightarrow{P}_{\text{չ}} = P_{\text{չ}}\left(\overrightarrow{u}\right) \\ \text{For Armenian spatial force} & \rightarrow & \overrightarrow{F}_{\text{չ}} = \dfrac{d\overrightarrow{P}_{\text{չ}}}{d\overrightarrow{t}} \end{cases} \Leftrightarrow \begin{cases} \text{For action integral} & \rightarrow & \overleftarrow{\text{Ե}}_{\text{չ}} \\ \text{For Armenian Lagrangian} & \rightarrow & \overleftarrow{\mathcal{L}}_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}\right) \\ \text{For Armenian energy} & \rightarrow & \overleftarrow{E}_{\text{չ}} = E_{\text{չ}}\left(\overleftarrow{u}\right) \\ \text{For Armenian momentum} & \rightarrow & \overleftarrow{P}_{\text{չ}} = P_{\text{չ}}\left(\overleftarrow{u}\right) \\ \text{For Armenian spatial force} & \rightarrow & \overleftarrow{F}_{\text{չ}} = \dfrac{d\overleftarrow{P}_{\text{չ}}}{d\overleftarrow{t}} \end{cases} \qquad (4\text{-}23)$$

In a similar way for some other K' inertial system we can define direct and opposite (inverted) inertial systems as well and use the following notations $(1.8-2)^1$:

$$\begin{cases} \text{For direct inertial system } K' & \rightarrow & \overrightarrow{K}' \\ \text{For opposite (inverted) inertial system } K' & \rightarrow & \overleftarrow{K}' \end{cases} \qquad (4\text{-}24)$$

Therefore, to distinguish the same moving test particle all physical quantities in the direct inertial system $\overrightarrow{K}'$ and in the opposite inertial system $\overleftarrow{K}'$ we need to use the following similar to $(4-22)$ and $(4-23)$ notations.

- *In Armenian Kinematics* $(1.8-3,4)^1$

$$\underline{\text{In the } \overrightarrow{K}' \text{ direct inertial system}} \qquad\qquad \underline{\text{In the } \overleftarrow{K}' \text{ opposite inertial system}}$$

$$\begin{cases} \text{For time} & \rightarrow & \overrightarrow{t}' \\ \text{For spatial position} & \rightarrow & \overrightarrow{x}' \\ \text{For velocity} & \rightarrow & \overrightarrow{u}' = \dfrac{d\overrightarrow{x}'}{d\overrightarrow{t}'} \\ \text{For acceleration} & \rightarrow & \overrightarrow{a}' = \dfrac{d\overrightarrow{u}'}{d\overrightarrow{t}'} \\ \text{For Armenian interval} & \rightarrow & \overrightarrow{\text{ե}}' \end{cases} \Leftrightarrow \begin{cases} \text{For time} & \rightarrow & \overleftarrow{t}' \\ \text{For spatial position} & \rightarrow & \overleftarrow{x}' \\ \text{For velocity} & \rightarrow & \overleftarrow{u}' = \dfrac{d\overleftarrow{x}'}{d\overleftarrow{t}'} \\ \text{For acceleration} & \rightarrow & \overleftarrow{a}' = \dfrac{d\overleftarrow{u}'}{d\overleftarrow{t}'} \\ \text{For Armenian interval} & \rightarrow & \overleftarrow{\text{ե}}' \end{cases} \qquad (4\text{-}25)$$

- *In Armenian Dynamics* $(\text{չ}2)^{1}$

In the $\overrightarrow{K}'$ direct inertial system

$$\begin{cases} \text{For action integral} & \rightarrow \quad \overrightarrow{\text{Ե}}'_{\text{չ}} \\ \text{For Armenian Lagrangian} & \rightarrow \quad \overrightarrow{\mathcal{L}}'_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\overrightarrow{u}'\right) \\ \text{For Armenian energy} & \rightarrow \quad \overrightarrow{E}'_{\text{չ}} = E_{\text{չ}}\left(\overrightarrow{u}'\right) \\ \text{For Armenian momentum} & \rightarrow \quad \overrightarrow{P}'_{\text{չ}} = P_{\text{չ}}\left(\overrightarrow{u}'\right) \\ \text{For Armenian spatial force} & \rightarrow \quad \overrightarrow{F}'_{\text{չ}} = \dfrac{d\overrightarrow{P}'_{\text{չ}}}{d\overrightarrow{t}'} \end{cases} \Leftrightarrow$$

In the $\overleftarrow{K}'$ opposite inertial system

$$\begin{cases} \text{For action integral} & \rightarrow \quad \overleftarrow{\text{Ե}}'_{\text{չ}} \\ \text{For Armenian Lagrangian} & \rightarrow \quad \overleftarrow{\mathcal{L}}'_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}'\right) \\ \text{For Armenian energy} & \rightarrow \quad \overleftarrow{E}'_{\text{չ}} = E_{\text{չ}}\left(\overleftarrow{u}'\right) \\ \text{For Armenian momentum} & \rightarrow \quad \overleftarrow{P}'_{\text{չ}} = P_{\text{չ}}\left(\overleftarrow{u}'\right) \\ \text{For Armenian spatial force} & \rightarrow \quad \overleftarrow{F}'_{\text{չ}} = \dfrac{d\overleftarrow{P}'_{\text{չ}}}{d\overleftarrow{t}'} \end{cases} \tag{4-26}$$

Moreover, if K' inertial system has a relative velocity v with respect to the inertial system K, then we call it direct relative velocity and accordingly we denote it as $\overrightarrow{v}$. Likewise if K inertial system has a relative velocity v' with respect to the inertial system K', which is physically the mirror reflected velocity of the direct relative velocity and we naturally denote it as $\overleftarrow{v}$. Therefore for mutual relative velocities between K and K' inertial systems we use the following notations $(1.8-5)^{1}$:

$$\begin{cases} \text{For direct relative velocity} & \rightarrow \quad v = \overrightarrow{v} \\ \text{For reciprocal relative velocity} & \rightarrow \quad v' = \overleftarrow{v} \end{cases} \tag{4-27}$$

Because reciprocal (inverse) velocity of the reciprocal relative velocity exactly is the same as the direct relative velocity, therefore that physical fact we can record in usual way or by vector sign notation the following ways $(15)^{3}$:

$$\boxed{(v')' = v \qquad \text{or} \qquad \overleftarrow{\left(\overleftarrow{v}\right)} = \overrightarrow{v}} \tag{4-28}$$

Remark 2 - *From the definition that the opposite inertial system is the full (left and right side) reflection of the direct inertial system, in legacy mechanics (classical and relativistic) it means that the physical quantities that have a direction - their signs reversed (except angular momentum and spin), while all scalar physical quantities do not change their signs. Also, absolute values of all the direct and reflected physical quantities (scalar or vector) are equal to each other. But that is not the case in the Armenian Theory of Relativity, where for some physical quantities that is correct but for some other quantities (scalar or vector) that is incorrect. Below are a list (not full) of unchanged and changed physical quantities.*

- *The physical quantities, whose absolute values in Armenian Theory of Relativity in the case of mirror reflection stays unchanged*

$$\begin{cases} \text{Position coordinates} & \rightarrow \quad \left|\overleftarrow{x}\right| = \left|\overrightarrow{x}\right| \\ \text{Armenian interval} & \rightarrow \quad \left|\overleftarrow{\text{ե}}\right| = \left|\overrightarrow{\text{ե}}\right| \\ \text{Least action integral} & \rightarrow \quad \left|\overleftarrow{\text{Ե}}_{\text{չ}}\right| = \left|\overrightarrow{\text{Ե}}_{\text{չ}}\right| \\ \text{Armenian energy} & \rightarrow \quad \left|\overleftarrow{E}_{\text{չ}}\right| = \left|\overrightarrow{E}_{\text{չ}}\right| \\ \text{Armenian spatial force} & \rightarrow \quad \left|\overleftarrow{F}_{\text{չ}}\right| = \left|\overrightarrow{F}_{\text{չ}}\right| \end{cases} \tag{4-29}$$

◆ *The physical quantities, whose absolute values in Armenian Theory of Relativity in the case of mirror reflection are changed*

$$\begin{cases} \text{Time interval of the event} & \rightarrow & \left|\overleftarrow{t}\right| \neq \left|\overrightarrow{t}\right| \\ \text{Movement velocities} & \rightarrow & \left|\overleftarrow{u}\right| \neq \left|\overrightarrow{u}\right| \\ \text{Movement accelerations} & \rightarrow & \left|\overleftarrow{a}\right| \neq \left|\overrightarrow{a}\right| \\ \text{Armenian Lagrangians} & \rightarrow & \left|\overleftarrow{\mathscr{L}}_{\text{չ}}\right| \neq \left|\overrightarrow{\mathscr{L}}_{\text{չ}}\right| \\ \text{Armenian linear momentums} & \rightarrow & \left|\overleftarrow{P}_{\text{չ}}\right| \neq \left|\overrightarrow{P}_{\text{չ}}\right| \end{cases} \tag{4-30}$$

Remark 3 - *Given by table* $(4-30)$ *the direct and mirror reflected physical quantities absolute value inequalities is specific only for Armenian Theory of Relativity whose results come as a complete surprise for legacy physics. These miraculous properties of physical quantities opens Pandora's box of the Universe and outlines a new horizon for future technology.*

As we have already mentioned in the introduction that two new universal constants s and g in Armenian Theory of Relativity in the case of mirror reflection stays unchanged. But that is not enough, we also need to know how the fundamental physical quantities such as time, space, velocity and acceleration are changed in the case of P-symmetry (in our article mirror reflection). Thanks to the Armenian Theory of Relativity, we have a complete answer to all those questions.

In the case of only space reversal (in our article mirror reflection) the time and space coordinates and their differentials Armenian transformation equations in the K and K' inertial systems has the following form.

◆ *In the case of mirror reflection Armenian transformations of the time-space coordinates in the K inertial system* $(1.8-15,17)^1,\ (12)^2,\ (06)^3$

$$\begin{cases} c\overleftarrow{t} = c\overrightarrow{t} + s\overrightarrow{x} \\ \overleftarrow{x} = -\overrightarrow{x} \end{cases} \quad \Leftrightarrow \quad \begin{cases} c\overrightarrow{t} = c\overleftarrow{t} + s\overleftarrow{x} \\ \overrightarrow{x} = -\overleftarrow{x} \end{cases} \tag{4-31}$$

◆ *In the case of mirror reflection Armenian transformations of the time-space coordinates differentials in the K inertial system* $(1.8-16,18,19)^1$

$$\begin{cases} d\overleftarrow{t} = \left(1 + s\dfrac{\overrightarrow{u}}{c}\right) d\overrightarrow{t} \\ d\overleftarrow{x} = -d\overrightarrow{x} \end{cases} \quad \Leftrightarrow \quad \begin{cases} d\overrightarrow{t} = \left(1 + s\dfrac{\overleftarrow{u}}{c}\right) d\overleftarrow{t} \\ d\overrightarrow{x} = -d\overleftarrow{x} \end{cases} \tag{4-32}$$

◆ *In the case of mirror reflection Armenian transformations of the time-space coordinates in the K' inertial system* $(1.8-15,17)^1$

$$\begin{cases} c\overleftarrow{t}' = c\overrightarrow{t}' + s\overrightarrow{x}' \\ \overleftarrow{x}' = -\overrightarrow{x}' \end{cases} \quad \Leftrightarrow \quad \begin{cases} c\overrightarrow{t}' = c\overleftarrow{t}' + s\overleftarrow{x}' \\ \overrightarrow{x}' = -\overleftarrow{x}' \end{cases} \tag{4-33}$$

◆ *In the case of mirror reflection Armenian transformations of the time-space coordinates differentials in the K' inertial system* $(1.8-16,18,19)^1$

$$\begin{cases} d\overleftarrow{t}' = \left(1 + s\dfrac{\overrightarrow{u}'}{c}\right) d\overrightarrow{t}' \\ d\overleftarrow{x}' = -d\overrightarrow{x}' \end{cases} \quad \Leftrightarrow \quad \begin{cases} d\overrightarrow{t}' = \left(1 + s\dfrac{\overleftarrow{u}'}{c}\right) d\overleftarrow{t}' \\ d\overrightarrow{x}' = -d\overleftarrow{x}' \end{cases} \tag{4-34}$$

Only in the case of mirror reflection, from moving test particle time-space coordinates differentials transformation equations, we can obtain the formula for the reflected opposite velocities in the K and K' inertial systems. For that purpose we need to use $(4-32)$ and $(4-34)$ system of the equations, dividing second equations by the first equations. Armenian reflected velocity formula is completely different from the legacy physics corresponding reciprocal velocity formula $\left(\overleftarrow{u} = -\vec{u}\right)$. Moreover Armenian opposite velocity formulas is applicable for relative velocity and for the test particle arbitrary velocity as well.

- *Armenian formula for direct and opposite (mirror reflected) velocities in the inertial systems* $(1.8-6,8)$[1]

In the K inertial system ⟺ In the K' inertial system

$$\begin{cases} \overleftarrow{u} = -\dfrac{\vec{u}}{1 + s\dfrac{\vec{u}}{c}} \\[2ex] \vec{u} = -\dfrac{\overleftarrow{u}}{1 + s\dfrac{\overleftarrow{u}}{c}} \end{cases} \quad \Leftrightarrow \quad \begin{cases} \overleftarrow{u}' = -\dfrac{\vec{u}'}{1 + s\dfrac{\vec{u}'}{c}} \\[2ex] \vec{u}' = -\dfrac{\overleftarrow{u}'}{1 + s\dfrac{\overleftarrow{u}'}{c}} \end{cases} \tag{4-35}$$

- *Direct and opposite velocities satisfy the following relation* $(1.8-9)$[1]

$$\left(1 + s\frac{\overleftarrow{u}}{c}\right)\left(1 + s\frac{\vec{u}}{c}\right) = 1 \tag{4-36}$$

- *Armenian gamma functions in the direct and opposite inertial systems have the same mathematical form, but they are not equal to each other* $(1.9-30)$[1], (6)[2], (16)[3]

$$\begin{cases} \text{Armenian gamma function in the direct inertial system} \quad \rightarrow \quad \gamma_{\text{Հ}}\left(\vec{v}\right) = \dfrac{1}{\sqrt{1 + s\dfrac{\vec{v}}{c} + g\dfrac{\vec{v}^2}{c^2}}} > 0 \\[3ex] \text{Armenian gamma function in the opposite inertial system} \quad \rightarrow \quad \gamma_{\text{Հ}}\left(\overleftarrow{v}\right) = \dfrac{1}{\sqrt{1 + s\dfrac{\overleftarrow{v}}{c} + g\dfrac{\overleftarrow{v}^2}{c^2}}} > 0 \end{cases} \tag{4-37}$$

- *In the direct and opposite inertial systems between corresponding gamma functions, there exist the following very important relations* $(1.9-31,32)$[1]$,(7)$[2]$,(17)$[3]

$$\begin{cases} \gamma_{\text{Հ}}\left(\overleftarrow{v}\right)\overleftarrow{v} = -\gamma_{\text{Հ}}\left(\vec{v}\right)\vec{v} \\[1ex] \gamma_{\text{Հ}}\left(\overleftarrow{v}\right) = \gamma_{\text{Հ}}\left(\vec{v}\right)\left(1 + s\dfrac{\vec{v}}{c}\right) > 0 \end{cases} \quad \Leftrightarrow \quad \begin{cases} \gamma_{\text{Հ}}\left(\vec{v}\right)\vec{v} = -\gamma_{\text{Հ}}\left(\overleftarrow{v}\right)\overleftarrow{v} \\[1ex] \gamma_{\text{Հ}}\left(\vec{v}\right) = \gamma_{\text{Հ}}\left(\overleftarrow{v}\right)\left(1 + s\dfrac{\overleftarrow{v}}{c}\right) > 0 \end{cases} \tag{4-38}$$

- *There exist also the following symmetric relation* $(\text{Հ}1-25)$[1], (17)[3]

$$\gamma_{\text{Հ}}\left(\overleftarrow{v}\right)\left(1 + \tfrac{1}{2}s\frac{\overleftarrow{v}}{c}\right) = \gamma_{\text{Հ}}\left(\vec{v}\right)\left(1 + \tfrac{1}{2}s\frac{\vec{v}}{c}\right) \tag{4-39}$$

- *There exist the following interesting relation as well* $(1.8-24)$[1], (6)[2]

$$\gamma_{\text{Հ}}\left(\overleftarrow{v}\right)\gamma_{\text{Հ}}\left(\vec{v}\right) = \frac{1 + s\dfrac{\vec{v}}{c}}{1 + s\dfrac{\vec{v}}{c} + g\dfrac{\vec{v}^2}{c^2}} = \frac{1 + s\dfrac{\overleftarrow{v}}{c}}{1 + s\dfrac{\overleftarrow{v}}{c} + g\dfrac{\overleftarrow{v}^2}{c^2}} = \frac{1}{1 - g\dfrac{\overleftarrow{v}\vec{v}}{c^2}} > 0 \tag{4-40}$$

◆ *In the case of space reversal, mathematical form of the Armenian formula for addition and subtraction of velocities <u>stays unchanged</u>* $(1.8-29,30)$[1]

In the direct inertial systems / In the opposite inertial systems

$$\begin{cases} \vec{u} = \dfrac{\vec{u}^{\,\prime} + \vec{v} + s\dfrac{\vec{v}\vec{u}^{\,\prime}}{c}}{1 - g\dfrac{\vec{v}\vec{u}^{\,\prime}}{c^2}} \\ \vec{u}^{\,\prime} = \dfrac{\vec{u} - \vec{v}}{1 + s\dfrac{\vec{v}}{c} + g\dfrac{\vec{v}\vec{u}}{c^2}} \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{u} = \dfrac{\overleftarrow{u}^{\,\prime} + \overleftarrow{v} + s\dfrac{\overleftarrow{v}\overleftarrow{u}^{\,\prime}}{c}}{1 - g\dfrac{\overleftarrow{v}\overleftarrow{u}^{\,\prime}}{c^2}} \\ \overleftarrow{u}^{\,\prime} = \dfrac{\overleftarrow{u} - \overleftarrow{v}}{1 + s\dfrac{\overleftarrow{v}}{c} + g\dfrac{\overleftarrow{v}\overleftarrow{u}}{c^2}} \end{cases} \tag{4-41}$$

◆ *In the case of space reversal, mathematical form of the Armenian gamma functions transformations equations <u>stays unchanged</u>* $(1.8-33,34)$[1]

$$\begin{cases} \gamma_{ք}\left(\vec{u}^{\,\prime}\right) = \gamma_{ք}\left(\vec{v}\right)\gamma_{ք}\left(\vec{u}\right)\left(1 + s\dfrac{\vec{v}}{c} + g\dfrac{\vec{v}\vec{u}}{c^2}\right) \\ \gamma_{ք}\left(\vec{u}\right) = \gamma_{ք}\left(\vec{v}\right)\gamma_{ք}\left(\vec{u}^{\,\prime}\right)\left(1 - g\dfrac{\vec{v}\vec{u}^{\,\prime}}{c^2}\right) \end{cases} \Leftrightarrow \begin{cases} \gamma_{ք}\left(\overleftarrow{u}^{\,\prime}\right) = \gamma_{ք}\left(\overleftarrow{v}\right)\gamma_{ք}\left(\overleftarrow{u}\right)\left(1 + s\dfrac{\overleftarrow{v}}{c} + g\dfrac{\overleftarrow{v}\overleftarrow{u}}{c^2}\right) \\ \gamma_{ք}\left(\overleftarrow{u}\right) = \gamma_{ք}\left(\overleftarrow{v}\right)\gamma_{ք}\left(\overleftarrow{u}^{\,\prime}\right)\left(1 - g\dfrac{\overleftarrow{v}\overleftarrow{u}^{\,\prime}}{c^2}\right) \end{cases} \tag{4-42}$$

◆ *In the case of space reversal, mathematical form of the product Armenian gamma functions and corresponding velocities <u>stays unchanged</u>* $(1.8-33,34)$[1]

$$\begin{cases} \gamma_{ք}\left(\vec{u}^{\,\prime}\right)\vec{u}^{\,\prime} = \gamma_{ք}\left(\vec{v}\right)\gamma_{ք}\left(\vec{u}\right)\left(\vec{u} - \vec{v}\right) \\ \gamma_{ք}\left(\vec{u}\right)\vec{u} = \gamma_{ք}\left(\vec{v}\right)\gamma_{ք}\left(\vec{u}^{\,\prime}\right)\left(\vec{u}^{\,\prime} + \vec{v} + s\dfrac{\vec{v}\vec{u}^{\,\prime}}{c}\right) \end{cases} \Leftrightarrow \begin{cases} \gamma_{ք}\left(\overleftarrow{u}^{\,\prime}\right)\overleftarrow{u}^{\,\prime} = \gamma_{ք}\left(\overleftarrow{v}\right)\gamma_{ք}\left(\overleftarrow{u}\right)\left(\overleftarrow{u} - \overleftarrow{v}\right) \\ \gamma_{ք}\left(\overleftarrow{u}\right)\overleftarrow{u} = \gamma_{ք}\left(\overleftarrow{v}\right)\gamma_{ք}\left(\overleftarrow{u}^{\,\prime}\right)\left(\overleftarrow{u}^{\,\prime} + \overleftarrow{v} + s\dfrac{\overleftarrow{v}\overleftarrow{u}^{\,\prime}}{c}\right) \end{cases} \tag{4-43}$$

We now know that <u>in the case of only mirror reflection</u>, in Armenian Theory of Relativity, how transforms the time-space $(4-31,33)$, the velocity $(4-35)$ and also we know the relation between direct and opposite gamma functions $(4-38)$, then we need to find out how transforms time-space coordinates between two inertial systems.

◆ *Armenian direct and inverse transformation equations between two ($\vec{K}$ and $\vec{K}^{\prime}$) direct (not reflected) inertial systems* $(1.8-25)$[1], (4)[2], $(07,08)$[3]

Armenian direct transformations / Armenian inverse transformations

$$\begin{cases} \vec{t}^{\,\prime} = \gamma_{ք}\left(\vec{v}\right)\left[\left(1 + s\dfrac{\vec{v}}{c}\right)\vec{t} + g\dfrac{\vec{v}}{c^2}\vec{x}\right] \\ \vec{x}^{\,\prime} = \gamma_{ք}\left(\vec{v}\right)\left(\vec{x} - \vec{v}\vec{t}\right) \end{cases} \quad \text{and} \quad \begin{cases} \vec{t} = \gamma_{ք}\left(\overleftarrow{v}\right)\left[\left(1 + s\dfrac{\overleftarrow{v}}{c}\right)\vec{t}^{\,\prime} + g\dfrac{\overleftarrow{v}}{c^2}\vec{x}^{\,\prime}\right] \\ \vec{x} = \gamma_{ք}\left(\overleftarrow{v}\right)\left(\vec{x}^{\,\prime} - \overleftarrow{v}\vec{t}^{\,\prime}\right) \end{cases} \tag{4-44}$$

Now using transformation equations $(4-44)$ and static mirror reflection transformations $(4-31)$ and $(4-33)$, we can obtain Armenian transformation equations between two ($\overleftarrow{K}$ and $\overleftarrow{K}^{\prime}$) opposite (full reflected) inertial systems, as you can see below.

- *Armenian direct and inverse transformation equations between two ($\overleftarrow{K}$ and $\overrightarrow{K}'$) opposite (full reflected) inertial systems*

Armenian direct transformations and Armenian inverse transformations

$$\begin{cases} \overleftarrow{t}' = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left[\left(1+s\frac{\overleftarrow{v}}{c}\right)\overleftarrow{t}+g\frac{\overleftarrow{v}}{c^2}\overleftarrow{x}\right] \\ \overleftarrow{x}' = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(\overleftarrow{x}-\overleftarrow{v}\overleftarrow{t}\right) \end{cases} \quad \text{and} \quad \begin{cases} \overleftarrow{t} = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left[\left(1+s\frac{\overrightarrow{v}}{c}\right)\overleftarrow{t}'+g\frac{\overrightarrow{v}}{c^2}\overleftarrow{x}'\right] \\ \overleftarrow{x} = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left(\overleftarrow{x}'-\overrightarrow{v}\overleftarrow{t}'\right) \end{cases} \tag{4-45}$$

Remark 4 - *Armenian transformation equations* $(4-45)$ *we can obtain also from Armenian transformation equations* $(4-44)$ *by just changing the vector notation sign to the opposite direction in all physical quantities.*

Their is some special interest to write down Armenian transformation equations between two different polarity inertial systems, such as between direct and reflected inertial systems or between reflected and direct inertial systems. Below you can see Armenian transformation equations between such mixed two inertial systems.

- *Armenian direct and inverse transformation equations between opposite* $\overleftarrow{K}'$ *and direct* $\overrightarrow{K}$ *inertial systems*

$$\begin{cases} c\overleftarrow{t}' = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left[c\overrightarrow{t}+\left(s+g\frac{\overrightarrow{v}}{c}\right)\overrightarrow{x}\right] \\ \overleftarrow{x}' = -\gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left(\overrightarrow{x}-\overrightarrow{v}\overrightarrow{t}\right) \end{cases} \quad \text{and} \quad \begin{cases} c\overrightarrow{t} = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left[c\overleftarrow{t}'+\left(s+g\frac{\overrightarrow{v}}{c}\right)\overleftarrow{x}'\right] \\ \overrightarrow{x} = -\gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left(\overleftarrow{x}'-\overrightarrow{v}\overleftarrow{t}'\right) \end{cases} \tag{4-46}$$

- *Armenian direct and inverse transformation equations between direct* $\overrightarrow{K}'$ *and opposite* $\overleftarrow{K}$ *inertial systems*

$$\begin{cases} c\overrightarrow{t}' = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left[c\overleftarrow{t}+\left(s+g\frac{\overleftarrow{v}}{c}\right)\overleftarrow{x}\right] \\ \overrightarrow{x}' = -\gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(\overleftarrow{x}-\overleftarrow{v}\overleftarrow{t}\right) \end{cases} \quad \text{and} \quad \begin{cases} c\overleftarrow{t} = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left[c\overrightarrow{t}'+\left(s+g\frac{\overleftarrow{v}}{c}\right)\overrightarrow{x}'\right] \\ \overleftarrow{x} = -\gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(\overrightarrow{x}'-\overleftarrow{v}\overrightarrow{t}'\right) \end{cases} \tag{4-47}$$

- *From* $(4-44)$ *and* $(4-45)$ *we can obtain the following time differentials relations* $(1.10-8)$[1]

$$\begin{cases} \frac{d\overrightarrow{t}'}{d\overrightarrow{t}} = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left(1+s\frac{\overrightarrow{v}}{c}+g\frac{\overrightarrow{v}\overrightarrow{u}}{c^2}\right) \\ \frac{d\overleftarrow{t}'}{d\overleftarrow{t}} = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(1+s\frac{\overleftarrow{v}}{c}+g\frac{\overleftarrow{v}\overleftarrow{u}}{c^2}\right) \end{cases} \quad \text{and} \quad \begin{cases} \frac{d\overrightarrow{t}}{d\overrightarrow{t}'} = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(1+s\frac{\overleftarrow{v}}{c}+g\frac{\overleftarrow{v}\overrightarrow{u}'}{c^2}\right) \\ \frac{d\overleftarrow{t}}{d\overleftarrow{t}'} = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left(1+s\frac{\overrightarrow{v}}{c}+g\frac{\overrightarrow{v}\overleftarrow{u}'}{c^2}\right) \end{cases} \tag{4-48}$$

- *From* $(4-46)$ *and* $(4-47)$ *we can obtain also the following time differentials relations*

$$\begin{cases} \frac{d\overleftarrow{t}'}{d\overrightarrow{t}} = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left(1+s\frac{\overrightarrow{u}}{c}+g\frac{\overrightarrow{v}\overrightarrow{u}}{c^2}\right) \\ \frac{d\overrightarrow{t}'}{d\overleftarrow{t}} = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(1+s\frac{\overleftarrow{u}}{c}+g\frac{\overleftarrow{v}\overleftarrow{u}}{c^2}\right) \end{cases} \quad \text{and} \quad \begin{cases} \frac{d\overrightarrow{t}}{d\overleftarrow{t}'} = \gamma_{\text{չ}}\left(\overrightarrow{v}\right)\left(1+s\frac{\overleftarrow{u}'}{c}+g\frac{\overrightarrow{v}\overleftarrow{u}'}{c^2}\right) \\ \frac{d\overleftarrow{t}}{d\overrightarrow{t}'} = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(1+s\frac{\overrightarrow{u}'}{c}+g\frac{\overleftarrow{v}\overrightarrow{u}'}{c^2}\right) \end{cases} \tag{4-49}$$

- *In the case of space reversal (mirror reflection) Armenian interval <u>stays invariant</u>* $(1.9-40)$[1]

$$\begin{aligned} \text{ա}^2\left(\overleftarrow{t},\overleftarrow{x}\right) &= \left(c\overleftarrow{t}\right)^2+s\left(c\overleftarrow{t}\right)\overleftarrow{x}+g\overleftarrow{x}^2 = \left(c\overrightarrow{t}+s\overrightarrow{x}\right)^2+s\left(c\overrightarrow{t}+s\overrightarrow{x}\right)\left(-\overrightarrow{x}\right)+g\left(-\overrightarrow{x}\right)^2 = \\ &= \left(c\overrightarrow{t}\right)^2+s\left(c\overrightarrow{t}\right)\overrightarrow{x}+g\overrightarrow{x}^2 = \text{ա}^2\left(\overrightarrow{t},\overrightarrow{x}\right) \end{aligned} \tag{4-50}$$

◆ *In the case of space reversal, the accelerations of test particle between two (K and K') direct and reflected inertial systems transforms by the following formulas and therefore their absolute values are* <u>*not equal*</u> $\left(\text{չ}2-3\right)^{1}$, $(24)^{3}$

<u>Between $\overleftarrow{K}$ and $\overrightarrow{K}$ inertial systems</u> and <u>Between $\overleftarrow{K}'$ and $\overrightarrow{K}'$ inertial systems</u>

$$\begin{cases} \overleftarrow{a} = -\dfrac{1}{\left(1+s\dfrac{\overrightarrow{u}}{c}\right)^{3}}\overrightarrow{a} \\ \overrightarrow{a} = -\dfrac{1}{\left(1+s\dfrac{\overleftarrow{u}}{c}\right)^{3}}\overleftarrow{a} \end{cases} \quad \text{and} \quad \begin{cases} \overleftarrow{a}' = -\dfrac{1}{\left(1+s\dfrac{\overrightarrow{u}'}{c}\right)^{3}}\overrightarrow{a}' \\ \overrightarrow{a}' = -\dfrac{1}{\left(1+s\dfrac{\overleftarrow{u}'}{c}\right)^{3}}\overleftarrow{a}' \end{cases} \tag{4-51}$$

◆ *In direct and reflected inertial systems, the test particle's direct and reflected accelerations* $(4-51)$ *satisfy the following relations* $\left(\text{չ}2-4\right)^{1}$

<u>Between $\overleftarrow{K}$ and $\overrightarrow{K}$ inertial systems</u> and <u>Between $\overleftarrow{K}'$ and $\overrightarrow{K}'$ inertial systems</u>

$$\gamma_{\text{չ}}^{3}\left(\overleftarrow{u}\right)\overleftarrow{a} = -\gamma_{\text{չ}}^{3}\left(\overrightarrow{u}\right)\overrightarrow{a} \quad \text{and} \quad \gamma_{\text{չ}}^{3}\left(\overleftarrow{u}'\right)\overleftarrow{a}' = -\gamma_{\text{չ}}^{3}\left(\overrightarrow{u}'\right)\overrightarrow{a}' \tag{4-52}$$

◆ *Test particle accelerations transformations between two (K and K') inertial systems* $\left(\text{չ}2-5\right)^{1}$, $(16)^{2}$, $(25)^{3}$

<u>Between $\overrightarrow{K}$ and $\overrightarrow{K}'$ direct inertial systems</u> ⇔ <u>Between $\overleftarrow{K}$ and $\overleftarrow{K}'$ opposite inertial systems</u>

$$\begin{cases} \overrightarrow{a} = \dfrac{1}{\gamma_{\text{չ}}^{3}\left(\overrightarrow{v}\right)\left(1-g\dfrac{\overrightarrow{v}\overrightarrow{u}'}{c^{2}}\right)^{3}}\overrightarrow{a}' \\ \overrightarrow{a}' = \dfrac{1}{\gamma_{\text{չ}}^{3}\left(\overrightarrow{v}\right)\left(1+s\dfrac{\overrightarrow{v}}{c}+g\dfrac{\overrightarrow{v}\overrightarrow{u}}{c^{2}}\right)^{3}}\overrightarrow{a} \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{a} = \dfrac{1}{\gamma_{\text{չ}}^{3}\left(\overleftarrow{v}\right)\left(1-g\dfrac{\overleftarrow{v}\overleftarrow{u}'}{c^{2}}\right)^{3}}\overleftarrow{a}' \\ \overleftarrow{a}' = \dfrac{1}{\gamma_{\text{չ}}^{3}\left(\overleftarrow{v}\right)\left(1+s\dfrac{\overleftarrow{v}}{c}+g\dfrac{\overleftarrow{v}\overleftarrow{u}}{c^{2}}\right)^{3}}\overleftarrow{a} \end{cases} \tag{4-53}$$

◆ *Test particle accelerations invariant relations between two inertial systems* K *and* K' $\left(\text{չ}2-6\right)^{1}$

<u>Between $\overrightarrow{K}$ and $\overrightarrow{K}'$ direct inertial systems</u> ⇔ <u>Between $\overleftarrow{K}$ and $\overleftarrow{K}'$ opposite inertial systems</u>

$$\gamma_{\text{չ}}^{3}\left(\overrightarrow{u}\right)\overrightarrow{a} = \gamma_{\text{չ}}^{3}\left(\overrightarrow{u}'\right)\overrightarrow{a}' \quad \Leftrightarrow \quad \gamma_{\text{չ}}^{3}\left(\overleftarrow{u}\right)\overleftarrow{a} = \gamma_{\text{չ}}^{3}\left(\overleftarrow{u}'\right)\overleftarrow{a}' \tag{4-54}$$

◆ *According to* $(4-54)$ *for test particle we can define a special acceleration (direct or opposite), calling them - Armenian acceleration, which stays invariant either between two direct inertial systems or between two opposite inertial systems* $\left(\text{չ}2-7\right)^{1}$, $(26)^{3}$

$$\begin{cases} \overrightarrow{a}_{\text{չ}} = \gamma_{\text{չ}}^{3}\left(\overrightarrow{u}\right)\overrightarrow{a} = \gamma_{\text{չ}}^{3}\left(\overrightarrow{u}'\right)\overrightarrow{a}' = \overrightarrow{a}_{\text{չ}}' \\ \overleftarrow{a}_{\text{չ}} = \gamma_{\text{չ}}^{3}\left(\overleftarrow{u}\right)\overleftarrow{a} = \gamma_{\text{չ}}^{3}\left(\overleftarrow{u}'\right)\overleftarrow{a}' = \overleftarrow{a}_{\text{չ}}' \end{cases} \tag{4-55}$$

◆ *Also according to* $(4-52)$, *these Armenian accelerations satisfy the following conditions* $\left(\text{չ}2-8\right)^{1}$, $(27)^{3}$

$$\begin{cases} \overleftarrow{a}_{\text{չ}} = -\overrightarrow{a}_{\text{չ}} \\ \overleftarrow{a}_{\text{չ}}' = -\overrightarrow{a}_{\text{չ}}' \end{cases} \tag{4-56}$$

◆ *We can also define the* <u>*Armenian rest mass*</u> *in the following way* $\left(\text{չ}2-9\right)$[1], (21)[2], (44)[3]

$$\boxed{m_{\text{չ}0} \;=\; -(g-\tfrac{1}{4}s^2)m_0 \;\gtrless\; 0} \qquad (4\text{-}57)$$

◆ *In Armenian mechanics, in the case of space reversal, least action integrals in* K *and* K' *inertial systems have* <u>*the same mathematical form*</u> $\left(\text{չ}2-22,23\right)$[1]

<u>In the $\vec{K}$ and $\overleftarrow{K}$ inertial systems</u>

$$\begin{cases} \vec{\text{Ե}}_{\text{չ}} = -m_0c^2 \displaystyle\int_{\vec{t}_1}^{\vec{t}_2} \sqrt{1+s\frac{\vec{u}}{c}+g\frac{\vec{u}^2}{c^2}}\,d\vec{t} \\ \overleftarrow{\text{Ե}}_{\text{չ}} = -m_0c^2 \displaystyle\int_{\overleftarrow{t}_1}^{\overleftarrow{t}_2} \sqrt{1+s\frac{\overleftarrow{u}}{c}+g\frac{\overleftarrow{u}^2}{c^2}}\,d\overleftarrow{t} \end{cases}$$

and

<u>In the $\vec{K}'$ and $\overleftarrow{K}'$ inertial systems</u>

$$\begin{cases} \vec{\text{Ե}}'_{\text{չ}} = -m_0c^2 \displaystyle\int_{\vec{t}'_1}^{\vec{t}'_2} \sqrt{1+s\frac{\vec{u}'}{c}+g\frac{\vec{u}'^2}{c^2}}\,d\vec{t}' \\ \overleftarrow{\text{Ե}}'_{\text{չ}} = -m_0c^2 \displaystyle\int_{\overleftarrow{t}'_1}^{\overleftarrow{t}'_2} \sqrt{1+s\frac{\overleftarrow{u}'}{c}+g\frac{\overleftarrow{u}'^2}{c^2}}\,d\overleftarrow{t}' \end{cases} \qquad (4\text{-}58)$$

◆ *Using* $(4-32)$, $(4-34)$, $(4-38)$, $(4-42)$ *and* $(4-48)$ *formulas we can prove that least action integral quantity* $(4-58)$ <u>*is invariant*</u> *for all direct and opposite inertial systems* $\left(\text{չ}2-24\right)$[1]

$$\boxed{\overleftarrow{\text{Ե}}_{\text{չ}} \;=\; \vec{\text{Ե}}_{\text{չ}} \;=\; \vec{\text{Ե}}'_{\text{չ}} \;=\; \overleftarrow{\text{Ե}}'_{\text{չ}} \;=\; \text{Ե}_{\text{չ}}} \qquad (4\text{-}59)$$

◆ *In Armenian mechanics, in the case of space reversal, the Armenian Lagrangian formulas mathematical form in* K *and* K' *inertial systems are invariant but* <u>*not equal to each other*</u> $\left(\text{չ}2-22,23\right)$[1]

<u>In the $\vec{K}$ and $\overleftarrow{K}$ inertial systems</u>

$$\begin{cases} \vec{\mathcal{L}}_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\vec{u}\right) = -m_0c^2\sqrt{1+s\dfrac{\vec{u}}{c}+g\dfrac{\vec{u}^2}{c^2}} \\ \overleftarrow{\mathcal{L}}_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}\right) = -m_0c^2\sqrt{1+s\dfrac{\overleftarrow{u}}{c}+g\dfrac{\overleftarrow{u}^2}{c^2}} \end{cases}$$

and

<u>In the $\vec{K}'$ and $\overleftarrow{K}'$ inertial systems</u>

$$\begin{cases} \vec{\mathcal{L}}'_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\vec{u}'\right) = -m_0c^2\sqrt{1+s\dfrac{\vec{u}'}{c}+g\dfrac{\vec{u}'^2}{c^2}} \\ \overleftarrow{\mathcal{L}}'_{\text{չ}} = \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}'\right) = -m_0c^2\sqrt{1+s\dfrac{\overleftarrow{u}'}{c}+g\dfrac{\overleftarrow{u}'^2}{c^2}} \end{cases} \qquad (4\text{-}60)$$

◆ *In Armenian mechanics, in the case of space reversal, Armenian Lagrangian formulas* $(4-60)$ *between* K *and* K' *inertial systems (direct and opposite) transform in the following way* $\left(\text{չ}2-25\right)$[1], (29)[3]

<u>Between $\overleftarrow{K}$ and $\vec{K}$ inertial systems</u>

$$\begin{cases} \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}\right) = \dfrac{\mathcal{L}_{\text{չ}}\left(\vec{u}\right)}{1+s\dfrac{\vec{u}}{c}} \\ \mathcal{L}_{\text{չ}}\left(\vec{u}\right) = \dfrac{\mathcal{L}_{\text{չ}}\left(\overleftarrow{u}\right)}{1+s\dfrac{\overleftarrow{u}}{c}} \end{cases}$$

and

<u>Between $\overleftarrow{K}'$ and $\vec{K}'$ inertial systems</u>

$$\begin{cases} \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}'\right) = \dfrac{\mathcal{L}_{\text{չ}}\left(\vec{u}'\right)}{1+s\dfrac{\vec{u}'}{c}} \\ \mathcal{L}_{\text{չ}}\left(\vec{u}'\right) = \dfrac{\mathcal{L}_{\text{չ}}\left(\overleftarrow{u}'\right)}{1+s\dfrac{\overleftarrow{u}'}{c}} \end{cases} \qquad (4\text{-}61)$$

◆ *Armenian Lagrangian functions transformation equations between two (K and K') direct and opposite inertial systems* $\left(\text{չ}2-26^{1}\right)$, $(30)^{3}$

Between $\vec{K}$ and $\vec{K}'$ direct inertial systems ⇔ Between $\overleftarrow{K}$ and $\overleftarrow{K}'$ opposite inertial systems

$$\begin{cases} \mathcal{L}_{\text{չ}}\left(\vec{u}'\right) = \dfrac{\sqrt{1+s\frac{\vec{v}}{c}+g\frac{\vec{v}^2}{c^2}}}{1+s\frac{\vec{v}}{c}+g\frac{\vec{v}\vec{u}}{c^2}}\mathcal{L}_{\text{չ}}\left(\vec{u}\right) \\ \mathcal{L}_{\text{չ}}\left(\vec{u}\right) = \dfrac{\sqrt{1+s\frac{\vec{v}}{c}+g\frac{\vec{v}^2}{c^2}}}{1-g\frac{\vec{v}\vec{u}'}{c^2}}\mathcal{L}_{\text{չ}}\left(\vec{u}'\right) \end{cases} \Leftrightarrow \begin{cases} \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}'\right) = \dfrac{\sqrt{1+s\frac{\overleftarrow{v}}{c}+g\frac{\overleftarrow{v}^2}{c^2}}}{1+s\frac{\overleftarrow{v}}{c}+g\frac{\overleftarrow{v}\overleftarrow{u}}{c^2}}\mathcal{L}_{\text{չ}}\left(\overleftarrow{u}\right) \\ \mathcal{L}_{\text{չ}}\left(\overleftarrow{u}\right) = \dfrac{\sqrt{1+s\frac{\overleftarrow{v}}{c}+g\frac{\overleftarrow{v}^2}{c^2}}}{1-g\frac{\overleftarrow{v}\overleftarrow{u}'}{c^2}}\mathcal{L}_{\text{չ}}\left(\overleftarrow{u}'\right) \end{cases} \qquad (4\text{-}62)$$

◆ *Armenian energy and Armenian momentum formulas in the direct and opposite inertial systems* K $\left(\text{չ}2-27\right)^{1}$

In the $\vec{K}$ direct inertial system ⇔ In the $\overleftarrow{K}$ opposite inertial system

$$\begin{cases} \vec{E}_{\text{չ}} = E_{\text{չ}}\left(\vec{u}\right) = \dfrac{1+\frac{1}{2}s\frac{\vec{u}}{c}}{\sqrt{1+s\frac{\vec{u}}{c}+g\frac{\vec{u}^2}{c^2}}}m_0c^2 \\ \vec{P}_{\text{չ}} = P_{\text{չ}}\left(\vec{u}\right) = -\dfrac{\frac{1}{2}s+g\frac{\vec{u}}{c}}{\sqrt{1+s\frac{\vec{u}}{c}+g\frac{\vec{u}^2}{c^2}}}m_0c \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{E}_{\text{չ}} = E_{\text{չ}}\left(\overleftarrow{u}\right) = \dfrac{1+\frac{1}{2}s\frac{\overleftarrow{u}}{c}}{\sqrt{1+s\frac{\overleftarrow{u}}{c}+g\frac{\overleftarrow{u}^2}{c^2}}}m_0c^2 \\ \overleftarrow{P}_{\text{չ}} = P_{\text{չ}}\left(\overleftarrow{u}\right) = -\dfrac{\frac{1}{2}s+g\frac{\overleftarrow{u}}{c}}{\sqrt{1+s\frac{\overleftarrow{u}}{c}+g\frac{\overleftarrow{u}^2}{c^2}}}m_0c \end{cases} \qquad (4\text{-}63)$$

◆ *Armenian energy and Armenian momentum formulas in the direct and opposite inertial systems* K'

In the $\vec{K}'$ direct inertial system ⇔ In the $\overleftarrow{K}'$ opposite inertial system

$$\begin{cases} \vec{E}'_{\text{չ}} = E_{\text{չ}}\left(\vec{u}'\right) = \dfrac{1+\frac{1}{2}s\frac{\vec{u}'}{c}}{\sqrt{1+s\frac{\vec{u}'}{c}+g\frac{\vec{u}'^2}{c^2}}}m_0c^2 \\ \vec{P}'_{\text{չ}} = P_{\text{չ}}\left(\vec{u}'\right) = -\dfrac{\frac{1}{2}s+g\frac{\vec{u}'}{c}}{\sqrt{1+s\frac{\vec{u}'}{c}+g\frac{\vec{u}'^2}{c^2}}}m_0c \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{E}'_{\text{չ}} = E_{\text{չ}}\left(\overleftarrow{u}'\right) = \dfrac{1+\frac{1}{2}s\frac{\overleftarrow{u}'}{c}}{\sqrt{1+s\frac{\overleftarrow{u}'}{c}+g\frac{\overleftarrow{u}'^2}{c^2}}}m_0c^2 \\ \overleftarrow{P}'_{\text{չ}} = P_{\text{չ}}\left(\overleftarrow{u}'\right) = -\dfrac{\frac{1}{2}s+g\frac{\overleftarrow{u}'}{c}}{\sqrt{1+s\frac{\overleftarrow{u}'}{c}+g\frac{\overleftarrow{u}'^2}{c^2}}}m_0c \end{cases} \qquad (4\text{-}64)$$

◆ *Armenian energy and Armenian momentum direct and inverse transformation equations between* $\vec{K}$ *and* $\vec{K}'$ *inertial systems* $\left(\text{չ}2-32\right)^{1}$, $(24)^{2}$, $(32,33)^{3}$

Direct transformations and Inverse Transformations

$$\begin{cases} \vec{E}'_{\text{չ}} = \gamma_{\text{չ}}\left(\vec{v}\right)\left(\vec{E}_{\text{չ}}-\vec{v}\vec{P}_{\text{չ}}\right) \\ \vec{P}'_{\text{չ}} = \gamma_{\text{չ}}\left(\vec{v}\right)\left[\left(1+s\frac{\vec{v}}{c}\right)\vec{P}_{\text{չ}}+g\frac{\vec{v}}{c^2}\vec{E}_{\text{չ}}\right] \end{cases} \quad \text{and} \quad \begin{cases} \vec{E}_{\text{չ}} = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left(\vec{E}'_{\text{չ}}-\overleftarrow{v}\vec{P}'_{\text{չ}}\right) \\ \vec{P}_{\text{չ}} = \gamma_{\text{չ}}\left(\overleftarrow{v}\right)\left[\left(1+s\frac{\overleftarrow{v}}{c}\right)\vec{P}'_{\text{չ}}+g\frac{\overleftarrow{v}}{c^2}\vec{E}'_{\text{չ}}\right] \end{cases} \qquad (4\text{-}65)$$

- *The test particle full energy Armenian formula* $\left(\text{ջ}2-33\right)^1$, $(25)^2$, $(34)^3$

$$\begin{cases} \left(g\frac{1}{c}\vec{E}_{\text{ջ}}\right)^2 + s\left(g\frac{1}{c}\vec{E}_{\text{ջ}}\right)\vec{P}_{\text{ջ}} + g\left(\vec{P}_{\text{ջ}}\right)^2 = \left(g\frac{1}{c}\vec{E}'_{\text{ջ}}\right)^2 + s\left(g\frac{1}{c}\vec{E}'_{\text{ջ}}\right)\vec{P}'_{\text{ջ}} + g\left(\vec{P}'_{\text{ջ}}\right)^2 = g(g-\tfrac{1}{4}s^2)(m_0c)^2 \\ \left(g\frac{1}{c}\overleftarrow{E}_{\text{ջ}}\right)^2 + s\left(g\frac{1}{c}\overleftarrow{E}_{\text{ջ}}\right)\overleftarrow{P}_{\text{ջ}} + g\left(\overleftarrow{P}_{\text{ջ}}\right)^2 = \left(g\frac{1}{c}\overleftarrow{E}'_{\text{ջ}}\right)^2 + s\left(g\frac{1}{c}\overleftarrow{E}'_{\text{ջ}}\right)\overleftarrow{P}'_{\text{ջ}} + g\left(\overleftarrow{P}'_{\text{ջ}}\right)^2 = g(g-\tfrac{1}{4}s^2)(m_0c)^2 \end{cases} \qquad (4\text{-}66)$$

- *Relation between direct and opposite (reflected) Armenian energy and Armenian momentum quantities* $\left(\text{ջ}2-28\right)^1$

$$\begin{cases} \overleftarrow{E}_{\text{ջ}} = \vec{E}_{\text{ջ}} = E_{\text{ջ}} \\ \overleftarrow{P}_{\text{ջ}} = -\left(\vec{P}_{\text{ջ}} + s\frac{1}{c}E_{\text{ջ}}\right) \end{cases} \quad \text{and} \quad \begin{cases} \overleftarrow{E}'_{\text{ջ}} = \vec{E}'_{\text{ջ}} = E'_{\text{ջ}} \\ \overleftarrow{P}'_{\text{ջ}} = -\left(\vec{P}'_{\text{ջ}} + s\frac{1}{c}E'_{\text{ջ}}\right) \end{cases} \qquad (4\text{-}67)$$

- *Differentiating Armenian linear momentum formulas* $(4-63)$ *and* $(4-64)$ *with respect to time, we obtain spatial components of the Armenian force formulas in direct and opposite inertial systems* $\left(\text{ջ}2-35,37\right)^1$

In the $\vec{K}$ and $\vec{K}'$ direct inertial systems — In the $\overleftarrow{K}$ and $\overleftarrow{K}'$ opposite inertial systems

$$\begin{cases} \vec{F}_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\vec{u}\right)\vec{a} \\ \vec{F}'_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\vec{u}'\right)\vec{a}' \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{F}_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\overleftarrow{u}\right)\overleftarrow{a} \\ \overleftarrow{F}'_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\overleftarrow{u}'\right)\overleftarrow{a}' \end{cases} \qquad (4\text{-}68)$$

- *Likewise, differentiating Armenian energy formulas* $(4-63)$ *and* $(4-64)$ *with respect to time, we obtain scalar components of the Armenian force formulas in direct and opposite inertial systems* $\left(\text{ջ}2-36,38\right)^1$

In the $\vec{K}$ and $\vec{K}'$ direct inertial systems — In the $\overleftarrow{K}$ and $\overleftarrow{K}'$ opposite inertial systems

$$\begin{cases} \vec{F}^0_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\frac{\vec{u}}{c}\gamma^3_{\text{ջ}}\left(\vec{u}\right)\vec{a} = \frac{\vec{u}}{c}\vec{F}_{\text{ջ}} \\ \vec{F}'^0_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\frac{\vec{u}'}{c}\gamma^3_{\text{ջ}}\left(\vec{u}'\right)\vec{a}' = \frac{\vec{u}'}{c}\vec{F}'_{\text{ջ}} \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{F}^0_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\frac{\overleftarrow{u}}{c}\gamma^3_{\text{ջ}}\left(\overleftarrow{u}\right)\overleftarrow{a} = \frac{\overleftarrow{u}}{c}F_{\text{ջ}} \\ \overleftarrow{F}'^0_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\frac{\overleftarrow{u}'}{c}\gamma^3_{\text{ջ}}\left(\overleftarrow{u}'\right)\overleftarrow{a}' = \frac{\overleftarrow{u}'}{c}\overleftarrow{F}'_{\text{ջ}} \end{cases} \qquad (4\text{-}69)$$

- *In the Armenian Theory of Relativity can be preserved Newtonian mechanics* second law, *if instead of legacy force we use spatial components of Armenian force* $(4-68)$, *instead of legacy rest mass we use Armenian rest mass* $(4-57)$ *and finally instead of legacy acceleration we use Armenian acceleration* $(4-55)$

In the $\vec{K}$ and $\vec{K}'$ direct inertial systems — In the $\overleftarrow{K}$ and $\overleftarrow{K}'$ opposite inertial systems

$$\boxed{\begin{cases} \vec{F}_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\vec{u}\right)\vec{a} = m_{\text{ջ}0}\vec{a}_{\text{ջ}} \\ \vec{F}'_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\vec{u}'\right)\vec{a}' = m_{\text{ջ}0}\vec{a}_{\text{ջ}} \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{F}_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\overleftarrow{u}\right)\overleftarrow{a} = m_{\text{ջ}0}\overleftarrow{a}_{\text{ջ}} \\ \overleftarrow{F}'_{\text{ջ}} = -(g-\tfrac{1}{4}s^2)m_0\gamma^3_{\text{ջ}}\left(\overleftarrow{u}'\right)\overleftarrow{a}' = m_{\text{ջ}0}\overleftarrow{a}_{\text{ջ}} \end{cases}} \qquad (4\text{-}70)$$

- *From* $(4-55)$, $(4-56)$ *and* $(4-70)$ *it follows that in Armenian Theory of Special Relativity also preserves Newtonian mechanics* first and third laws $\left(\text{ջ}2-40\right)^1$, $(46)^3$

First law of the Newtonian mechanics — Third law of the Newtonian mechanics

$$\boxed{\begin{cases} \vec{F}_{\text{ջ}} = \vec{F}'_{\text{ջ}} \\ \overleftarrow{F}_{\text{ջ}} = \overleftarrow{F}'_{\text{ջ}} \end{cases} \Leftrightarrow \begin{cases} \overleftarrow{F}_{\text{ջ}} = -\vec{F}_{\text{ջ}} \\ \overleftarrow{F}'_{\text{ջ}} = -\vec{F}'_{\text{ջ}} \end{cases}} \qquad (4\text{-}71)$$

Conclusions

If we denote time reversal and space reversal operations by the following notations:

$$\begin{cases} \text{Only time reversal operation} & \rightarrow & \widehat{\mathbf{T}} \\ \text{Only space reversal operation} & \rightarrow & \widehat{\mathbf{P}} = \widehat{\mathbf{R}}_x{}^{*} \\ \text{Time and space reversal operations together} & \rightarrow & \widehat{\mathbf{T}}\widehat{\mathbf{R}}_x \text{ or } \widehat{\mathbf{R}}_x\widehat{\mathbf{T}} \end{cases} \tag{4-72}$$

* - In one dimensional space, spatial-reversal operation is equivalent of mirror reflection about x axis.

Then the concise list of our obtained results in Armenian Theory of Relativity, you can see in the following table:

(4-73)

Time and space reversal transformations	→	$\widehat{\mathbf{T}}$		$\widehat{\mathbf{P}} = \widehat{\mathbf{R}}_x$		$\widehat{\mathbf{T}}\widehat{\mathbf{R}}_x = \widehat{\mathbf{R}}_x\widehat{\mathbf{T}}$
Time-space asymmetry coefficient	→	$-s$	→	s	→	$-s$
Time-space metric coefficient	→	g	→	g	→	g
The test particle event time	→	$-t$	→	$t+s\frac{1}{c}x$	→	$-\left(t+s\frac{1}{c}x\right)$
The test particle position	→	x	→	$-x$	→	$-x$
The test particle mass	→	m	→	m	→	m
The test particle velocity	→	$-u$	→	$-\frac{u}{1+s\frac{u}{c}}$	→	$\frac{u}{1+s\frac{u}{c}}$
The test particle acceleration	→	a	→	$-\frac{1}{\left(1+s\frac{u}{c}\right)^3}a$	→	$-\frac{1}{\left(1+s\frac{u}{c}\right)^3}a$
The test particle Armenian Lagrangian	→	$\mathcal{L}$	→	$\frac{\mathcal{L}}{1+s\frac{u}{c}}$	→	$\frac{\mathcal{L}}{1+s\frac{u}{c}}$
The test particle Armenian energy	→	E	→	E	→	E
The test particle Armenian linear momentum	→	$-P$	→	$-P-s\frac{1}{c}E$	→	$P+s\frac{1}{c}E$
The Armenian force acting on the test particle	→	F	→	$-F$	→	$-F$
The test particle Armenian angular momentum	→	$-\vec{l}^{\,**}$				

** - In one dimensional space not exist angular momentum, therefore for now we don't discussed it.

The laws of legacy mechanics have always shown complete symmetry between the left and the right.

As you can see from the table $(4-73)$, in Armenian Theory of Relativity not exist legacy mechanics mirror symmetry properties and instead we have that left and right sides are not equal each other. But mean time we can say that left and right sides are not distinguishable either and that asymmetry is relative because its true for each inertial systems. Because two time the same space-reversal operation brings the particle in the same original state.

This is not violation of parity but this is the new way to define the P-symmetry.

Armenian relativistic formulas is full of asymmetry, which is in every single formula because of coefficient asymmetry s and that asymmetry is the essence and exciting part of the Armenian Theory of Relativity and therefore we demand a revision all legacy mechanics under these remarkable new circumstances.

The time has also come to reopen NASA's BPP program, but this time using our everywhere existing asymmetry formulas. And this will lead us to harness infinite energy from rest particle's momentum just as we harness energy from the wind using a windmill. Going in this path will bring forth the dawn of a new technological era.

References

1. "Armenian Theory of Special Relativity - One Dimensional Movement", YSU, June 2013, Armenia
2. "Armenian Theory of Special Relativity", Infinite Energy, Volume 20, Issue 115, May 2014, USA
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Editor-in-Chief and Associate Editors of the Physics Journals

March 25, 2014

Dear Editors,

We are pleased to submit our original manuscript in letter format, entitled “Armenian Theory of Special Relativity - One Dimensional Space”, where we provide important results only from our main research by authors Robert Nazaryan and Haik Nazaryan for consideration to publish in the journal. It is our pleasure to inform you and the scientific community that we have succeeded to build a mathematically solid theory of relativity in one dimensional space, which is an unambiguous generalization of the Lorentz transformation equations. Our article is the accumulation of all efforts from physicists to build a more general transformation equations of relativity.

In our manuscript, we derive general transformation equations for relativity in one physical dimension for homogeneous and anisotropic time-space continuum and accordingly we build a new relativistic theory and received amazing new formulas.

Here we provide for you a few important results.

1. *Armenian Transformation Equations*

Direct transformations and Inverse transformations

$$\left\{\begin{aligned} t' &= \gamma_{չ}(v)\left[\left(1+s\frac{v}{c}\right)t+g\frac{v}{c^2}x\right] \\ x' &= \gamma_{չ}(v)(x-vt) \end{aligned}\right. \quad \text{and} \quad \left\{\begin{aligned} t &= \gamma_{չ}(v')\left[\left(1+s\frac{v'}{c}\right)t'+g\frac{v'}{c^2}x'\right] \\ x &= \gamma_{չ}(v')(x'-v't') \end{aligned}\right. \tag{1}$$

2. *Armenian gamma functions for direct and reciprocal relative velocities*

$$\left\{\begin{aligned} \gamma_{չ}(v) &= \frac{1}{\sqrt{1+s\frac{v}{c}+g\frac{v^2}{c^2}}} > 0 \\ \gamma_{չ}(v') &= \frac{1}{\sqrt{1+s\frac{v'}{c}+g\frac{v'^2}{c^2}}} > 0 \end{aligned}\right. \tag{2}$$

3. *Relations between reciprocal and direct relative velocities*

$$\left\{\begin{aligned} v' &= -\frac{v}{1+s\frac{v}{c}} \\ v &= -\frac{v'}{1+s\frac{v'}{c}} \end{aligned}\right. \tag{3}$$

4. *Armenian invariant interval expression*

$$\text{ե}^2 = (ct')^2 + s(ct')x' + gx'^2 = (ct)^2 + s(ct)x + gx^2 > 0 \tag{4}$$

5. *Armenian relativistic Lagrangian function for free moving particle*

$$\mathcal{L}_{\text{չ}}(w) = -m_0c^2\sqrt{1 + s\frac{w}{c} + g\frac{w^2}{c^2}} \tag{5}$$

6. *Armenian relativistic energy and momentum formulas for free moving particle*

$$\begin{cases} E_{\text{չ}}(w) = \dfrac{1 + \frac{1}{2}s\frac{w}{c}}{\sqrt{1 + s\frac{w}{c} + g\frac{w^2}{c^2}}}m_0c^2 \\ P_{\text{չ}}(w) = -\dfrac{\frac{1}{2}s + g\frac{w}{c}}{\sqrt{1 + s\frac{w}{c} + g\frac{w^2}{c^2}}}m_0c \end{cases} \tag{6}$$

7. *Armenian momentum formula for rest particle, which is a very new and bizarre result*

$$P_{\text{չ}}(0) = -\frac{1}{2}sm_0c \tag{7}$$

8. *Armenian dark energy and dark mass formulas*

$$\begin{cases} E_{\text{խ}} = \dfrac{1}{8}s^2m_0c^2 \\ m_{\text{խ}} = \dfrac{1}{8}s^2m_0 \end{cases} \tag{8}$$

It is worth to mention that Lorentz transformation equations and all other Lorentz relativistic formulas can be obtained from the Armenian Theory of Special Relativity as particular case, by substituting $s = 0$ and $g = -1$.

We believe that our manuscript is appropriate for publication in your journal because it is an interdisciplinary journal. Our manuscript creates a paradigm for advance studies in relativistic kinematics and dynamics. Armenian energy and momentum formulas (6), which the world never seen before, have unpredictable applications in applied physics. For example, by manipulating the time-space constants s and g we can obtain numerous fascinating results.

Furthermore Armenian momentum formula for rest particle (7) - is the formula for the future, which shows how we can unleash unlimited free energy from a vacuum.

We confirm that our manuscript has not been published elsewhere and we have no conflicts of interest to disclose.

Please address all correspondence to author Robert Nazaryan: robert@armeniantheory.com

Thank you for your consideration!

Sincerely,

Haik Nazaryan
Graduate Student CSUN

Enlighten The World With Armenian Theory of Relativity
(Annus Mirabilis - 21 December 2012)

15 April 2014

Dear Researcher of Truth,

I am pleased to send you our original article in letter format and full article (in Armenian), entitled: "*Armenian Theory of Special Relativity - One Dimensional Movement*", also other supplemental materials, for your consideration and records - *100 anniversary of Armenian genocide*.

In our 4 page article-letter we provide only important results from our main research manuscript by Robert Nazaryan and Haik Nazaryan, published in June 2013 by Yerevan State University (in Armenian language, 86 pages).

It is our pleasure to inform you and the scientific community that in our main research-manuscript we have succeeded to build a mathematically solid theory of relativity in one dimensional space, which is an unambiguous generalization of the Lorentz transformation equations. Our article is the accumulation of all efforts from mathematicians and physicists to build a more general transformation equations of relativity in one dimension.

It is worth to mention that Lorentz transformation equations and all other Lorentz relativistic formulas can be obtained from the *Armenian Theory of Special Relativity* as particular case, by substituting $s = 0$ and $g = -1$.

In our main research, we derive general transformation equations for relativity in one physical dimension for homogeneous and anisotropic time-space continuum. Accordingly we build a new relativistic theory and received many amazing relativistic formulas.

As you can see from our article-letter, we are a few steps away from constructing a unified field theory, which can change the face of modern physics as we know it now. But the final stage of the construction will come after we finish the *Armenian Theory of Relativity* in three dimensions.

Our published manuscript creates a paradigm for advance studies in relativistic kinematics and dynamics. Armenian energy and momentum formulas (*which the world has never seen before*), have unpredictable applications in applied physics. For example, by manipulating the time-space constants s and g we can obtain numerous fascinating practical results. Our manuscript would be of interest to a broad readership including those who are interested in theoretical aspects of teleportation, time travel, antigravitation, infinite free energy and so on...

Furthermore Armenian momentum formula for rest particle - is the formula for the future, which shows how we can unleash unlimited free energy from a vacuum.

Please address all correspondence concerning this main research and published manuscript to Ministry of Education and Science of Armenia or Yerevan State University Physics Department and feel free to correspond by E-mail (robert@armeniantheory.com).

Thank you for your consideration of our scientific research, which can enlighten the World!

Sincerely,

Robert Nazaryan
Physics Department,
Yerevan State University

Dirty Games of the Scientific Journals

15 October 2014

Dear Reader,

We have sent our article entitled “*Armenian Theory of Special Relativity Illustrated*” to thousands of so called theoretical physicists all over the globe and submitted our article to hundreds of major scientific magazines.

We got a reply back from only a few physicists but their responses seemed like it was coming more from loan brokers or physicians than from scientists. None of them addressed the subject of the article on whether or not our new and generalized relativistic formulas or the new theory are correct or not.

From the editors of the scientific journals we almost always get the same answer: “*not suitable for our journal*”, “*not appropriate for our journal*”, “… *we regret to inform you that we have concluded that it is not suitable for publication*”, “*I am sorry to inform you that your submission entitled ‘Armenian Theory of Special Relativity Illustrated’ will not be considered for publication* … *and will be removed*”.

Every time when I receive a rejection letter from editors, I remember this horrible game which I have heard a long time ago that was played with small fishes by people to satisfy their own sadistic nature. The horrible game goes somewhat like this. A group of sick twisted people raising fishes in a dirty and poisonous environment and then putting them in clean unpolluted water where the fishes start to suffer and die because they are not used to living in such a clean environment. All this is happening to satisfy the sadistic nature of a few men that enjoy watching how fishes die.

The reason why I am telling you this sad story is because every time I receive rejection letters from scientific journal editors, I always remember this horrible game.

These “poor fishes” which I speak of in this case are all scientific journal editors who are born in an intoxicated scientific environment and educated by design in pseudo-scientific universities which we have today, but more importantly they can never even imagine the existence of a pure theoretical physics.

Otherwise how can we explain the fact that they don’t even have the ability or decency to just compare with each other two simple algebraic formulas and conclude which one is more general and elegant?

What factors are blinding them to see the reality and generality that is so obvious?

I have just one logical explanation that they all have been educated in corrupt “toxic” institutions and they are working in the companies with a hidden agenda and that’s why they never even assumed the existence of pure “clean” theoretical physics.

That’s why they cannot stand to see simple or general and elegant physical formulas. They also get frightened by even just reading the title of the article which causes them to not look at the content at all.

But their days are numbered and ether energy age has begun!

Robert Nazaryan
Physics Department,
Yerevan State University

Armenian Theory of Relativity is a Theory of Asymmetric Relativity

17 December 2014, Los Angeles

Dear German Researcher,

First I would like to thank you for your letter and genuine questions.

Second I hope you have had a chance to read my letter to Her Excellency Chancellor Angela Merkel which shows my philosophical and political mindset that I am carrying for more than 40 years.

Our research is really original, which has the aim to end the chaos and speculations in the theory of relativity and in theoretical physics at large, using only mathematical logic to build a theory of relativity in one dimension, then in 3 dimensions and finally to build the unified field theory.

This situation is very similar to that of Euclid's time, where Euclid with the power of logic and a few axioms ended all the speculations and confusion in geometry and brought peace to mathematics.

As I understand it after Heisenberg's quantum theory (1925) and Dirac's relativistic quantum theory (1928) – theoretical physics came to a halt. Eighty five years have passed from those days and no progress has been made in theoretical physics at all. And in that existing long lasting vacuum in theoretical physics, opportunist "physicists" are promoting artificial and false theories like "string theory", "super string theory", "K theory", "big bang theory" and so on… which is leading Europe and the whole world into another dark age.

Dear fellow researcher I have for many years been thinking about how to use rest particle asymmetric momentum energy and till now I don't have any idea how to do that because I am not that good of an experimental physicist. We need a new Faraday who can in some spectacular way tune into very complex time-space fabrics and harness energy from it like a windmill.

We need to trigger the scientific community and motivate current brilliant experimenters to use their brain power to unleash that universal force from Pandora's Box. For that to occur we need to spread our theoretical results across scientific communities so it can reach those experimental physicists than can finish the job.

Please don't worry about so called paradoxes. This is the job of some class of people who are not good in mathematics. If somebody succeeded in using our formulas of rest particle momentum to harness the energy from vacuum, then all the paradoxes will come to an end.

Now back to answering your question about twin paradoxes or any other paradoxes. Because of the existence of Universal Absolute Inertial System all other inertial systems are moving against that absolute system and that's why that direction is making relativity transformations and relativistic formulas asymmetric. For example if two inertial systems have the same rod with length ℓ, then observers in both inertial system see different lengths. In Lorentz relativity theory they are equal; this is the way which we understand the phenomena RELATIVE. But not anymore because of the existence of *Absolute Rest Inertial System*, space becomes asymmetric. *Therefore, now is the time for Asymmetric Relativity*. Please check our formulas and results $(3-21)$, $(3-22)$, $(3-23)$ in the article "*Theoretical Foundation of Infinite Free Energy*". I am attaching it again to this E-mail. In the meantime this article (11 pages) is still unpublished and I cannot find a publisher brave enough to publish it.

Dear friend, it would be great if you had connections that can help us publish our article so that way we can reach that particular experimenter who can build that *infinite energy device*, which can fuel the cosmic spaceships of the near future. We need to reopen NASA's BPP program which will bring forth the dawn of a new technological era.

100 years of inquisition in physics is now over and ether energy ege has begun!

Robert Nazaryan
Physics Department,
Yerevan State University

Symmetry Problems in Armenian Theory of Relativity

25 December 2014

Dear Academic Sergei Matinyan,

My father Robert Nazaryan and I are the author and coauthor (respectively) of many articles and on behalf of my father I am sending you our last article entitled «*Symmetry Problems in Armenian Theory of Relativity*». My father said that it was because of your letters and questions about the time-reversal or space-reversal problems in *Armenian Theory of Relativity* that gave him the impulse and passion to write this article.

To this E-mail I am attaching our new article (Armenian and English versions) and also my father's special letter to you.

My father has sent you E-mails, but he thinks you might be blocking his E-mail address or even IP address, so he asks me to send you this letter, to be sure that you received our article which has complete answers to all of your questions.

Dear Matinyan, if you find out that our explanations are correct and are satisfying you, then I like to ask you for a favor to refer our article and help us to publish it in proper scientific journals. We have problems for publishing our articles because of its title «*Armenian...*», which is why we are asking for your help. We don't like to give up our articles name, especially since it has become our scientific brand name.

We would like to wish you a Merry Christmas and a happy new year and would also like to congratulate you on your coming 84-th birthday. May you live many years to come so you can witness the glory of *Armenian Theory*.

I am part of the new generation of Armenian Physicists that will continue what has been left over.

Thank you for reading my letter.

Long Live Armenia!

Haik Nazaryan
haik.nazaryan.341@my.csun.edu
Physics & Astronomy Department
California State University, Northridge

The time has come to reopen NASA's and DARPA's exotic programs

08 March 2015

Hello Dear Fullerton Physics Department Professor,

My name is Haik Nazaryan and I am currently a physics graduate student at California State University Northridge. I first heard about you a few days ago while I was watching the Ancient Aliens documentary on Stargates and I felt the necessary urge to write you a letter. My father Robert Nazaryan is a retired theoretical physicist and has been doing research for more than 40 years (on and off) in particular subjects such as relativity and the unified field theory. In June 2013, in Armenia, we published our book (where I am written as the coauthor) titled "*The Armenian Theory of Special Relativity in One Dimension*" in Armenian language. In our book we mathematically derive a whole new and more general set of relativistic transformation equations that are far more rich and beautiful than today's Lorentz Transformation equations. This book we believe sets the ground stone for a whole new physics that is yet to come. This main research as a short communication has been published in "*Infinite Energy*" magazine, volume 20, issue 115, May 2014.

Couple month later we published our new article entitled "*Armenian Theory of Special Relativity Illustrated*" (11 pages) where we compare Armenian relativistic formulas with Lorentz relativistic formulas and illustrate how general and rich our Armenian Theory of Special Relativity really is with a spectacular build in asymmetry. That build in asymmetry is the essence and exciting part of the *Armenian Theory of Relativity* which is reincarnating the ether as a universal rest reference medium.

Recently we published another article titled "*Time and Space Reversal Problems in Armenian Theory of Relativity*" (17 pages) where we show that Armenian Theory of Special Relativity does not contradict in quality with legacy relativity, but gives a more detailed and fine description of that symmetry in physics and shows that *Armenian Theory of Relativity is a Theory of Asymmetric Relativity*.

Dear professor we know that today's current technology which wreaks havoc on the environment is not the future and that there is a whole new science out there that is on the brink of being unleashed if only more like minded people like us worked together towards that goal. When we heard you talk on the show we were happy to know that there are others out there that think like we do and have an open mind to the possibilities of a creating a whole new technology that will be harmonious with nature.

The time has also come to reopen NASA's BPP program or DARPA's Casmir Effect Enhancement program, but this time using our everywhere existing Armenian asymmetric formulas. This will lead us to harness infinite energy from rest particle's momentum just as we harness energy from the wind using a windmill. Going in this path will bring forth the dawn of a new technological era.

To this E-mail we have attached our three latest articles for your consideration and we hope that by using your exceptional experimental skills and our Armenian asymmetric relativistic formulas we can in the very near future design an implosion engine for spaceships and find a way to build a device which can harness infinite energy from a vacuum and also travel across our galaxy using stargates.

100 years of inquisition in physics is now over and Ether Infinite Energy Age has begun!

Thank you for your time and I will be looking forward to your response.

Haik Nazaryan
haik@nazaryan.com
CSUN Physics Department

Answer From Fullerton Physics Department Professor

09 March 2015

Mr. Nazaryan,

I do not open attachments from people I do not know.
I suggest you rename your theory.
Armenian special relativity has overtones of Aryan physics.

Regards,
Fullerton Physics Department Professor

Haik Nazaryan's response to Fullerton Physics Department Professor

15 March 2015

Hello again Fullerton Physics Department Professor,

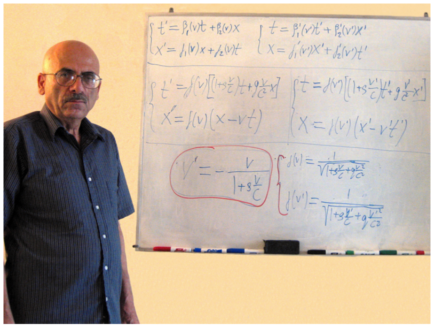
I am disappointed in your short heartless response, a response I wouldn't give to my worst enemy. I was hoping you would show some more appreciation and gratitude for someone that supports your work and is trying to show you something new and possibly work with you in the near future, but instead you shun us off like some Jehovah's witnesses. With all due respect that is very unprofessional and unscientific of you. We will not compromise on the name because there are elements on the periodic table named after specific nations (Germanium, Francium, etc) and there is something called a "Polish Space" in mathematics named after Polish topologists and logicians. Let's also not forget the famous Bavarian Motor Works aka BMW. It is completely normal and natural for us to name the theory Armenian because it has sprung from the mind of an Armenian physicist. Besides, you should not judge the article by its title just as you should not judge a book by its cover as the saying goes.

So please reconsider your approach to our theory.

Best Regards,

Haik Nazaryan
CSUN Physics Department

Short Biographies of Authors



Robert Nazaryan in front of his board
at his humble apartment, August 19, 2012

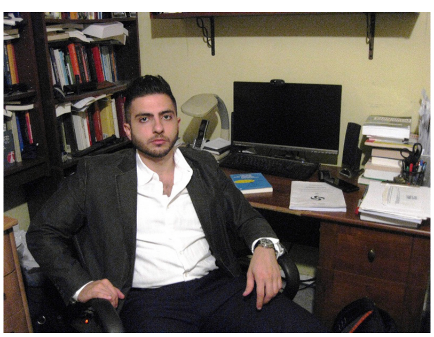
Robert Nazaryan, a grandson of surviving victims of the Armenian Genocide (1915-1921), was born on August 7, 1948 in Yerevan, the capital of Armenia. As a senior in high school he won first prize in the national mathematics Olympiad of Armenia in 1966. Then he attended the Physics department at Yerevan State University from 1966-1971 and received his MS in Theoretical Physics. After graduating from Yerevan State University he attended a Theological Seminary from 1971-1973 at Etchmiadzin, Armenia and received Bachelor of Theology degree. Then he worked at different institutions as an engineer not related to physics. For seven years (1978-1985) he was imprisoned as a political prisoner in the USSR for fighting for the self-determination of Armenia. He has Armenian citizenship and from 1988 till now he has been a resident of the United States.

He has many ideas and unpublished articles in theoretical physics that are waiting his time to be revealed.

The article “Armenian Theory of Special Relativity - One Dimensional Movement” was registered on December 21, 2012 at USA Copyright Office and published as a book (in Armenian language) in Armenia June 2013. This published book has been dedicated to the 20-th anniversary of the liberation of the Shushi, the legendary Armenian city.

Right now he is working to finish “Armenian Theory of Relativity in 3 physical dimensions” (most general case).

He has three sons, two daughters and six grandchildren.



Haik Nazaryan by his desk, 2014

Haik Nazaryan was born on May 12, 1989 in Los Angeles, California. He attended Glendale Community College from 2009-2011 then he transferred to California State University Northridge and got his Master of Science degree in physics 2015. He is now teaching as an adjunct instructor at Glendale Community College.

Short Subject Index